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### COMPARISON OF SKELETAL MATURATION OF SUBJECTS WITH HORIZONTAL AND VERTICAL FACIAL GROWTH PATTERNS

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**Aim:** Establishing skeletal maturity in orthodontics is an important part in clinical and scientific research. Facial growth occurs in vertical and horizontal dimensions. Depending on the dominance of one of the components, three basic growth patterns are known; neutral, vertical and horizontal. The purpose of the study was to determine whether there is a difference between skeletal and chronological age in subjects with different facial growth patterns.

**Materials and methods:** The study was conducted on a total of 146 subjects (48 with horizontal, 48 with vertical and 50 with neutral growth patterns) aged 12 to 18 years. Determination of facial growth pattern was done by cephalometric analysis (Zagreb 82 MOD), using the Dolphin 10.5 software and 8 variables were measured on each cephalogram. Skeletal maturity estimation was performed according to CVMS tables.

**Results:** Statistically significant differences ( $p < 0.001$ ) were found between subjects with horizontal and vertical growth pattern and between the subjects with neutral and vertical growth pattern ( $p < 0.05$ ), while between horizontal and neutral there was no significant difference in skeletal maturity. In group 12 – 15 yrs of age there was statistically significant difference ( $p < 0.05$ ) in skeletal maturity between subjects with horizontal and vertical growth pattern. In older group (16 – 18 yrs) there was statistically significant difference ( $p > 0.05$ ) in skeletal maturity between subjects with vertical growth pattern comparing with horizontal and neutral. Subjects aged 12 to 15 years with a horizontal and neutral growth pattern were on average in the fourth and vertical in the third stage of skeletal maturity. In the older age group (16 to 18 years), subjects with a horizontal and neutral growth pattern were on average in the fifth and vertical in the fourth stage of skeletal maturity.

**Conclusion:** Subjects with vertical growth pattern were in lower stage of skeletal maturity than those with horizontal growth pattern at the same chronological age. Subjects with vertical growth pattern were in lower stage of skeletal maturity than those with horizontal and neutral growth pattern at the same chronological age.

**Key words:** skeletal maturation; horizontal facial growth pattern; vertical facial growth pattern

### USPOREDBA SKELETNOG SAZRIJEVANJA ISPITANIKA S HORIZONTALNIM I VERTIKALNIM OBRASCEM RASTA LICA

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**Svrha:** Utvrđivanje skeletne zrelosti u ortodontiji važno je kako u kliničkom tako i u znanstveno-istraživačkom radu. Rast lica događa se u vertikalnoj i horizontalnoj dimenziji. Ovisno o dominaciji jedne od komponenata poznata su tri osnovna obrasca rasta; neutralni, vertikalni i horizontalni. Svrha istraživanja bila je utvrditi postoji li razlika između skeletne i kronološke dobi u ispitanika s različitim obrascima rasta lica.

**Materijali i metode:** Ispitivanje je provedeno na ukupno 146 ispitanika (48 s horizontalnim, 48 s vertikalnim i 50 s neutralnim obrascem rasta) dobi od 12 do 18 godina. Određivanje obrasca rasta lica napravljeno je temeljem rtg kefalometrijske analize (Zagreb 82 MOD), pomoću programa Dolphin 10.5. te je na svakom rentgenogramu izmjereno 8 varijabli. Procjena stupnja skeletne zrelosti rađena je prema CVMS tablicama.

**Rezultati:** U skupini 12 – 15 god postoji statistički značajna razlika ( $p < 0,05$ ) skeletnog sazrijevanja između ispitanika s horizontalnim i vertikalnim obrascem rasta, dok u skupini od 16 do 18 godina postoji statistički značajna razlika ( $p < 0,05$ ) skeletnog sazrijevanja između ispitanika s vertikalnim obrascem rasta u odnosu na ispitanike s neutralnim i horizontalnim. Ispitanici u dobnoj skupini od 12 do 15 godina s horizontalnim i neutralnim obrascem rasta prosječno su u četvrtom, a s vertikalnim u trećem stadiju skeletne zrelosti. U starijoj dobnoj skupini (16 do 18 godina) ispitanici s horizontalnim i neutralnim obrascem rasta prosječno su u petom, a s vertikalnim u četvrtom stadiju skeletne zrelosti.

**Zaključak:** U dobnoj skupini od 12 do 15 godina ispitanici s vertikalnim obrascem rasta zaostaju u skeletnom sazrijevanju u odnosu na ispitanike s horizontalnim obrascem rasta, a u skupini od 16 do 18 godina ispitanici s vertikalnim obrascem rasta zaostaju u skeletnom sazrijevanju u odnosu na ispitanike s neutralnim i horizontalnim obrascem rasta.

**Ključne riječi:** skeletno sazrijevanje; horizontalni obrazac rasta lica; vertikalni obrazac rasta lica

### INFLUENCE OF LIP POSITION ON FACIAL ESTHETICS

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**Aim:** Since the orthodontic movement of the teeth affects the position of the lips and the appearance of the lower third of the face, it is important to know what the public considers to be the ideal profile in order to improve facial aesthetics. Aims of the study were to compare the perception of male and female profile photographs modified by changing the sagittal position of the jaws. Furthermore, to determine if there is a statistically significant difference in the esthetic preferences among dentists and laypersons for facial profile, and to determine if orthodontic standards based on skeletal and dental Class I are in correlation with the values of attractive profiles.

**Material and Methods:** Photographs and cephalograms of male and female models were scanned and a superimposition was done. In the Dolphin Imaging computer program, photos were modified by changing the sagittal position of the jaw by at least 4mm in or-

### UTJECAJ POLOŽAJA USANA NA ESTETIKU LICA

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**Svrha:** S obzirom da ortodontski pomak zubi utječe na položaj usana i izgled donje trećine lica, u svrhu poboljšanja estetike lica važno je spoznati što javnost smatra idealnim profilom. Svrha istraživanja bila je usporediti percepciju muških i ženskih profilnih fotografija koje su modificirane promjenom sagitalnog položaja čeljusti. Nadalje, utvrditi postoji li statistički značajna razlika u percepciji atraktivnosti profila lica na osnovi odabira profila doktora dentalne medicine i laika te utvrditi jesu li ortodontski standardi, bazirani na skeletnoj i dentalnoj klasi I u korelaciji s vrijednostima atraktivnih profila.

**Materijali i metode:** Fotografije i laterolateralni rentgenogrami glave muškog i ženskog modela skenirani su te je napravljena superpozicija. U računalnom programu Dolphin Imaging fotografije su modificirane mijenjanjem sagitalnog položaja čeljusti za najmanje 4mm kako bi se dobilo još 5 fotografija za svaki spol, ukupno 6 fotografija za ocjenjivanje.

der to get another 5 photos for each gender, a total of 6 photos for evaluation. The study encompasses 135 evaluators, of whom 35 were dental practitioners and 100 lay people. They were asked to rank six profiles according to their attractiveness in such a way that the most attractive profile was numbered 1, and the least attractive by 6.

Results: Normal and bimaxillary protrusive profiles were judged to be highly attractive according to dental professionals and laypersons. There was a statistically significant difference in the selection of the most attractive profile. Dental professionals preferred a normal profile, while laypersons preferred a bimaxillary protrusion. Profiles with mandibular protrusion were judged as the least attractive in both groups of evaluators. Other profiles were ranked equally by both groups of raters.

Conclusion: It was found that the public prefers slightly more protrusive dentofacial relationships than those based on orthodontic standards, hence a more convex profile, and anteriorly positioned lips. All evaluators were more tolerant towards the horizontal displacement of the maxilla position relative to the mandibular displacement, suggesting that the perception of successful orthodontic-surgical treatment may depend more on the correction of the mandibular position.

Key words: lip position; facial esthetics

## INCIDENCE AND ETIOLOGY OF NON-CARIOUS CERVICAL LESIONS

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Aim: The purpose of this study was to determine the incidence and distribution of non-carious cervical lesions (NCL) in adult patients and to correlate the occurrence of cervical lesions with oral status, dietary and functional habits, age and sex.

Materials and methods: The survey involved 120 subjects. After the clinical examination, the respondents filled out a questionnaire composed of 18 multiple-choice questions. The collected data were statistically processed using Microsoft Office Excel, and MedCalc with the significance level of 0.05.

Results: From 3137 examined teeth in the sample, 203 NCLs were discovered, at 41.6% of subjects. The number of non-carious lesions significantly increases with age, whereas the prevalence with respect to the sex is similar. Significantly more lesions were detected in the post-canine sector (74.88%) than in the anterior region (25.12%). The analysis of the influence of certain dietary habits showed a significant association between the emergence of NCL with the consumption of sour fruit, whereas the consumption of carbonated drinks did not show the same effect. Subjects without NCLs brush teeth more frequently than subjects with NCLs. Type of toothbrush, method of toothbrushing and parafunctional habits did not show any influence on the higher incidence of NCLs. The class of occlusion affects the finding of non-carious lesions ( $p = 0.0012$ ), while the type of occlusion has no effect on the occurrence of NCLs ( $p = 0.057$ ).

Conclusion: The prevalence of NCLs is rather substantial, as well as the existence of various risk factors for their emergence. Prevention has the most important role in reducing the incidence of these lesions, and remedy is requisite in patients whose oral examination discovers such lesions.

Key words: non-carious cervical lesion; dietary habits; occlusion; parafunction; prevalence

## EVALUATION OF PERFORMING ENODONTIC TREATMENT PROCEDURES IN DENTAL OFFICES IN CROATIA

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Aim: Endodontic treatment comprises a series of stages equally important for the success of treatment. During the operation in the endodontic space various endodontic instruments, technical equipment and chemicals are used, however, the success of the procedure, among other things, depends on their proper use as well as on the experience, routine, skills and engagement of the therapist. Endodontic procedures are among the most demanding dental procedures with the greatest impact on the overall human health since untreated infections or inadequately performed procedures can lead to serious complications and greatly undermine the overall health of the body.

Materials and methods: The primary goal of the study is to assess the adequacy of the procedures performed by doctors of dental medicine in Croatia during endodontic treatment, and the percentage of dentists who do not use the recommended procedure in their clinical practice. A fixed hypothesis H1 was set: at least 20% of dentists in Croatia do not use the recommended endodontic protocols which would certainly mean that intervention in endodontic practice of Croatian dentists is necessary. An additional aim of the study is to identify factors that influence performing recommended procedures and the

Istraživanje obuhvaća 135 ocjenjivača od kojih je 35 bilo doktora dentalne medicine i 100 laika. Zamoljeni su da rangiraju šest profila prema atraktivnosti na način da najatraktivniji profil označe brojem 1, a najmanje atraktivan brojem 6.

Rezultati: Obje grupe ocjenjivača za najatraktivnije profile biraju normalan profil i bimaksilarnu protruziju. Utvrđena je statistički značajna razlika u odabiru najatraktivnijeg profila. Doktori dentalne medicine na prvo mjesto stavljaju normalan profil, dok laici preferiraju bimaksilarnu protruziju. Kao najmanje atraktivan profil kod svih ocjenjivača bio je onaj s protruzijom mandibule. Ostale profile obje grupe ocjenjivača rangiraju na isti način.

Zaključak: Utvrđeno je da javnost preferira nešto protrudirane dentofacijalne odnose od onih na kojima se baziraju ortodontski standardi, dakle konveksniji profil te punije i više anteriorno položene usne. Svi ocjenjivači tolerantniji su prema horizontalnom pomaku položaja maksile u odnosu na pomak mandibule, što sugerira kako bi percepcija uspješnog ortodontsko-kirurškog liječenja mogla ovisiti više o korekciji položaja mandibule.

Glavne riječi: položaj usana; estetika lica

## UČESTALOST I ETIOLOGIJA NEKARIJESNIH CERVICALNIH LEZIJA

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Svrha: Svrha ovoga istraživanja bila je utvrditi učestalost i distribuciju nekarijesnih cervikalnih lezija (NCL) u odraslih pacijenata te povezati pojavu nastanka cervikalnih lezija s oralnim statusom, prehranbenim i funkcijskim navikama, dobi i spolom.

Materijali i metode: U istraživanju je sudjelovalo 120 ispitanika. Pri kliničkom pregledu korištena je stomatološka i parodontološka sonda, ogledalo i umjetno svjetlo. Nakon pregleda ispitanici su popunjavali i upitnik sadržan od 18 pitanja s ponuđenim odgovorima. Prikupljeni podatci statistički su obrađeni programima Microsoft Office Excel i MedCalc uz razinu značajnosti od 0,05.

Rezultati: U uzorku od 3 137 pregledanih zubi, nađeno je 203 NCL-a, kod 41,6 % ispitanika. Broj lezija se značajno povećava s godinama života, dok je prevalencija u odnosu na spol podjednaka. U postkaninom sektoru zabilježeno je značajno više lezija (74,88 %), nego u anteriornom (25,12 %). Analiza utjecaja prehranbenih navika pokazala je značajnu povezanost nastanka NCL-a s konzumacijom kiselog voća, dok konzumacija gaziranih pića nije pokazala takav utjecaj. Ispitanici bez NCL-a učestalije četkaju zube u usporedbi s ispitanicima s NCL-om. Vrsta četkice, metoda četkanja i parafunkcijske navike nisu pokazali utjecaj na pojavnost NCL-a. Klasa okluzije ima utjecaj na nalaz nekarijesnih lezija ( $p = 0,0012$ ), dok vrsta okluzije nema utjecaj na pojavnost NCL-a ( $p = 0,057$ ).

Zaključak: Na osnovu dobivenih rezultata može se zaključiti da je prevalencija NCL-a dosta velika, kao i postojanje različitih faktora rizika za njihov nastanak. Prevencija ima najvažniju ulogu u smanjenju incidencije tih lezija, a kod pacijenata kod kojih se oralnim pregledom utvrdi postojanje takvih lezija nužna je sanacija.

Glavne riječi: nekarijesne cervikalne lezije; oralni status

## PROCJENA POSTUPAKA IZVEDBE ENDODONTSKIH ZAHVATA U ORDINACIJAMA DENTALNE MEDICINE U HRVATSKOJ

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Svrha: Endodontski zahvat se sastoji od niza faza koje su jednako važne za uspjeh liječenja. Različiti endodontski instrumenti, tehnička pomagala i kemijska sredstva rabe se tijekom rada u endodontskom prostoru, a uspjeh zahvata, između ostalog, ovisi o njihovoj pravilnoj uporabi, te o iskustvu, rutini, vještini i angažiranosti terapeuta. Endodontski zahvati pripadaju najzahtjevnijim stomatološkim zahvatima s najvećim utjecajem na ukupno zdravlje ljudi s obzirom da netretirane infekcije ili nedovoljno kvalitetno izvedeni zahvati mogu dovesti do ozbiljnih komplikacija te uvelike narušiti opće zdravstveno stanje organizma. Primarni cilj istraživanja je procijeniti adekvatnost postupaka koje provode doktori dentalne medicine u Hrvatskoj pri endodontskom liječenju, te koliki je udio stomatologa koji u svojoj praksi ne rabe preporučenu proceduru. Postavljena je fiksna hipoteza H1: barem 20% stomatologa u Hrvatskoj ne rabi preporučene postupke pri endodontskim zahvatima što bi svakako značilo da je potrebno intervenirati u endodontsku praksu hrvatskih stomatologa. Dodatni cilj je ustanoviti čimbenike koji utječu na pridržavanje preporučene procedure kao i utjecaj ostalih mogućih varijabli (godine iskustva, spol, edukacija, godina završetka edukacije, dodatna edukacija, specijalizacija).

impact of other possible variables (years of experience, gender, education, years of completion of the training, additional training, specialization). This research is applicational, observational, retrospective and cross-sectional type and will be conducted by an anonymous survey method that dentists voluntarily and individually fulfill. The survey contains approximately 100 questions, most of them with qualitative and comparative measures. Participants will answer the questions in an anonymous questionnaire survey, along which they will also receive an explanatory text stating the purpose of the research (informed consent).

Results: Based on the data collected, the current state of endodontic practice in Croatia will be evaluated with regard to used endodontic procedures, instrumentation and filling techniques, canal irrigation and filling materials, use of intracanal and systemic medications, incidents, complications during treatment, success and attitudes towards endodontic protocols, attending endodontic courses of continuing education.

Conclusion: By analyzing the data obtained, the effort will be made to point out the possible needs and steps that could improve the quality of endodontic treatment in Croatia. Key words: endodontic treatment; quality

#### MICROINVASIVE THERAPY OF HIPOMINERALIZED ENAMEL BY APPLICATION OF INFILTRATION RESIN

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Aim: Infiltration of the low viscosity resin is being used for the purpose of interceptive effect by closing the micro-porosity of the enamel formed due to the demineralization and developmental defects. Fluctuations of the pH values in the biofilm of the teeth may cause mineral loss when the pH decreases, and the number of the pores of the surface zone of the initial caries lesion increases from 10 to 50 times. Minimal intervention in order to preserve hard dental tissues allows to permanently close the micro-porosity inside the demineralized enamel and instantaneous aesthetic effect.

The aim of this paper is to show the procedure and effect of the application of the infiltration resin.

Materials and methods: Diffuse white lesion which is not of caries origin on vestibular surface of the upper left incisor is treated with the infiltration resin ICON (DMG, Chemisch-Pharmazeutische Fabrik GmbH, Hamburg, Germany). After taking the medical history of the patient and conducting the clinical inspection, and with consent of the patient, prophylactical cleaning of the tooth surface and isolation of teeth is done by installing a protective rubber dam. The etching is done with the 15% hydrochloric acid (Icon-Etch) for 2 minutes. After rinsing with water for 30 seconds and drying, the dehydration with 95% ethanol (Icon-Dry) is done for 30 seconds. We apply low-viscous resin TEGDMA (Icon-Infiltrant) during 3 minutes which is then dried and polymerized for 40 seconds.

Results: Partial disappearance of the white spot is visible immediately after infiltration and the defect of the enamel has been optically masked.

Conclusion: The structure of the natural enamel cannot be fully compensated, but by applying low-viscous infiltration resin, there is a replacement for the conventional remineralization and long-term solution for the purpose of mechanical stability of closed lesion.

Key words: microinvasive therapy; demineralised enamel; infiltration resin

#### MINIMALLY INVASIVE PREPARATION FOR ESTHETICS VENEERS

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Aim: The idea behind minimally invasive cosmetic dentistry is that the clinician should choose the most conservative method possible, thereby avoiding unnecessary wear and tear on the dental structure, while restoring function and appearance to the patient. The development of minimally invasive dentistry was only possible thanks to technological advances in ceramic systems and development of the adhesive cementation technique. Dentists optend to limit tooth preparation to the space required for these restorations, so as to develop the original emergence profile of the teeth. Esthetics veneers not only restore esthetics look but already improve tooth function.

Materials and methods: A 23-year male patient presented in private dental clinic with composite veneers on upper conoid lateral incisors. At the first visit, intraoral photographs were obtained to analyze the cosmetic aspects of the case, alginate impressions of the upper and lower dental arches were obtained. The dental casts were mounted in an articulator. Diagnostic wax-up of the upper model was made and after that mock-up in patient's mouth. Next step was making tooth preparation, impressions and making the provisory. Lithium disilicate esthetics veneers are cementated with adhesive technique.

Results: Expected goals are achieving facial aesthetics and ensuring functional harmony

Materijali i metode: Istraživanje je primijenjenog, opservacijskog, retrospektivnog i presječnog tipa i odvijat će se metodom anonimne ankete koju stomatolozi dobrovoljno i samostalno ispunjavaju. Anketa sadrži približno 100 pitanja, većinom s kvalitativnim i porredbenim mjerama. Ispitanici će odgovoriti na pitanja u anonimnoj anketi uz koju će dobiti i tekst objašnjenja u kojem se navodi svrha istraživanja (informirani pristanak).

Rezultati: Temeljem prikupljenih podataka procijenit će se aktualno stanje endodontskog liječenja u Hrvatskoj s obzirom na rabljene endodontske postupke, tehnike instrumentacije i punjenja kanala, materijale za irigaciju i punjenje kanala, uporabu intrakanalnih i sistemskih medikamena, incidente, komplikacije tretmana, uspješnost i stavove spram endodontskog liječenja, pohađanje endodontskih tečajeva trajne edukacije.

Zaključak: Analizom dobivenih podataka, nastojat će se ukazati na moguće potrebe i korake kojima bi se mogla poboljšati kvaliteta endodontskog liječenja u Hrvatskoj.

Glavne riječi: endodontski zahvat; kvaliteta endodontskog liječenja

#### MIKROINVAZIVNA TERAPIJA HIPOMINERALIZIRANE ČAKLINE PRIMJENOM INFILTRACIJSKE SMOLE

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Svrha: Infiltracija niskoviskoznom smolom primjenjuje se u svrhu interceptivnog učinka zatvaranjem mikroporoziteta cakline nastalih uslijed demineralizacije i razvojnih defekata. Fluktuacije pH-vrijednosti u biofilmu zuba mogu uzrokovati mineralni gubitak kada se pH smanjuje, a broj pora površinske zone inicijalne karijesne lezije povećavaju 10 do 50 puta. Minimalna intervencija u svrhu očuvanja tvrdih zubnih tkiva omogućuje trajno zatvaranje mikroporoziteta unutar demineralizirane cakline te trenutni estetski učinak. Svrha ovog rada je prikazati provedbu i učinak primjene infiltracijske smole.

Materijali i metode: Difuzna bijela lezija nekarijesnog podrijetla na vestibularnoj plohi gornjeg lijevog inciziva tretira se infiltracijskom smolom ICON (DMG, Chemisch-Pharmazeutische Fabrik GmbH, Hamburg, Njemačka). Nakon uzete anamneze i provedenog kliničkog pregleda, a uz suglasnost pacijenta provede se profilaktičko čišćenje površine zuba i izolacija zuba postavljanjem zaštitne gumene platičice. Provede se jetkanje 15% hidrokloridnom kiselinom (Icon-Etch) 2 minute. Nakon ispiranja vodom 30 sekundi i sušenja, provede se dehidracija primjenom 95% etanolom (Icon-Dry) 30 sekundi. Nanese se niskoviskozna smola TEGDMA (Icon-Infiltrant) u trajanju 3 minute koja se potom suši i polimerizira 40 sekundi.

Rezultati: Djelomični nestanak bijele mrlje vidljiv je neposredno nakon završetka infiltracije te se caklini defekt optički maskirao.

Zaključak: Struktura prirodne cakline ne može se nadomjestiti u potpunosti. Suvremena dentalna medicina primjenjujući niskoviskoznu infiltracijsku smolu, nadomjestak je konvencionalnoj remineralizaciji i dugotrajno rješenje u svrhu mehaničke stabilnosti završene lezije.

Glavne riječi: mikroin vazivna terapija; demineralizirana caklina; infiltracijska smola

#### MINIMALNO INVAZIVNO BRUŠENJE ZA ESTETSKE LJUSKE

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Svrha: Estetske ljuske spadaju u minimalno invazivan protetski rad. Minimalno invazivnim brušenjem čuvamo strukturu prirodnog zuba i maksimalno štedimo tvrdo zubno tkivo. Njihova je prednost minimalna invazivnost, dugotrajnost te odlična optička svojstva potpune keramike. Preparacija zuba za estetske ljuske može biti i manja od 0.5 mm čime se zadržavamo u većini slučajeva u samoj caklini zuba. Keramičke ljuske predstavljaju restaurativni estetski izbor u velikom broju kliničkih slučajeva u kojima bi donedavno bile izrađene potpune krunice. One ne samo da onovljaju estetski izgled već i poboljšavaju funkciju zuba.

Materijali i metode: Ispitanik je pacijent privatne stomatološke ordinacije, 23 god. sa starim dotrajanim kompozitnim ljuskama na gornjim koničnim lateralnim sjekutićima. Postupak rada počinje planiranjem koje uključuje intraoralno fotografiranje, otisak gornje i donje čeljusti, registracija obrasnim lukom i prijenos odnosa u artikulaturu. Nakon toga slijedi navoštavanje u laboratoriju i proba mock upa u ustima pacijenta. Sljedeći korak je brušenje, otisci i izrada privremenog rada. Nakon izrade ljuski od litij disilikatne keramike, pacijentu se nakon završne probe izoliraju zubi i ljuske se cementiraju adhezivnom tehnikom.

between the gum tissue and the dental anatomy.

**Conclusion:** The most important aspect of minimally invasive preparation is saving healthy enamel. Treatment success depends on the perfect interaction between the patient, clinician and dental technician. An adhesive cementation technique is fundamental to retain the veneers, given that they lack preparation for mechanical retention. This restorations offer a successful treatment that preserves tooth structure while providing excellent esthetic result and patient acceptance.

**Key words:** minimally invasive preparation; esthetics veneers

#### CHALLENGES IN THE MANAGING OF PARTIALLY EDENTULOUS PATIENT WITH ANTERIOR CROSSBITE - CASE REPORT

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**Aim:** Anterior crossbite are most often associated with incapacity of mastication, inappropriate phonation and not well-favored appearance. The objective of this case report is to reveal that an exact evaluation of vertical occlusal dimension is crucial for good rehabilitation.

**Materials and methods:** This case report describes a 56 year-old-male who has had several characteristic of bite collapse, reduction of the vertical occlusal dimension, tendency of teeth to move toward each other as they wear. Using a specific design of tooth preparation are the crucial factor in restoration fit of this case. Preparation aspects included reduction in more than 1.5mm of the lingual surface of upper teeth and opposite in lower jaw, thus buccal surface of lower teeth was reduced more, this reduction philosophy happened in order to imitate optimal occlusion.

**Results:** Occlusal overlay splint was delivered after the deduction of increasing vertical dimension analyzed by physiologic and facial measurements and anatomical landmark. Once the harmony of the new vertical occlusal dimension has been established, fixed restoration was set under way.

**Conclusion:** The case reports that a satisfying functional and aesthetic outcome was attained as a result of revamping the vertical occlusal dimension.

**Key words:** partially edentulous patient; anterior crossbite

#### INFLUENCE OF OCCLUSAL SCHEME IN COMPLETE DENTURES ON ORAL HEALTH RELATED QUALITY OF LIFE – LINGUALIZED VS. BILATERAL BALANCED OCCLUSION

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**Aim:** One of the main intention of complete denture therapy is restoring occlusion. There is no agreement regarding occlusal scheme for complete denture treatment. The occlusal scheme used in complete dentures therapy can effect on general patient satisfaction with complete dentures. Aim of this study was to compare the impact of two occlusal concepts of complete dentures, lingualized occlusion and bilateral balanced occlusion, on quality of life in edentulous patients.

**Materials and methods:** In this randomized clinical trial, 16 patients have been provided with new complete dentures. All patients received new complete dentures with two different occlusal concepts (9 patients received complete dentures with lingualized occlusion and 7 patients received new complete dentures with bilateral balanced occlusion). One month after insertion all patients completed shortened version of oral health impact profile (OHIP-14) questionnaire. Responses of each item are made on a Likert-type scale and coded as: 0 - never, 1 - hardly ever, 2 - occasionally, 3 - fairly often, and 4 - very often. Data were analysed using the Independent samples t test via SPSS version 18.0.

**Results:** Patients wearing dentures with bilateral balanced occlusion showed on average 0.25 points higher OHIP-14 scores compared to patients wearing dentures with lingualized occlusion. This effect of the occlusal concept on patient's satisfaction was neither statistically nor clinically significant.

**Conclusion:** The results of this randomised clinical trial provided evidence that the occlusal scheme did not influence on patient satisfaction with complete dentures.

**Key words:** occlusal scheme; complete dentures; oral health related quality of life

**Rezultati:** Očekivani rezultati su estetska i funkcijska trajnost i međusoban sklad zuba u zubnom luku sa novim estetskim nadomjestkom. Ljuske sa minimalnom preparacijom omogućit će dugoročno stabilne estetske rezultate, veliko pacijentovo zadovoljstvo i očuvanje zdravlja parodontu uz adekvatnu oralnu higijenu.

**Zaključak:** Važan aspekt minimalno invazivne preparacije je očuvanje zdrave cakline. Estetske Ljuske su funkcionalno jedno od najdužih terapijskih sredstava u fiksnoj protetiци. Razlog tome je adhezija keramike i kompozitnog materijala sa zubom. Razvojem adhezivnih tehnika cementiranja došlo je do sve veće upotrebe minimalno invazivnih radova kakve su estetske Ljuske i smanjenje potrebe za krunicama. Klinički uspjeh Ljuski ovisi o pažljivom planiranju terapije od samoga početka. Jako je bitno predviđanje ishoda terapije, pravilna preparacija, pridržavanje protokola i tada Ljuske imaju dugi životni vijek u ustima pacijenta.

**Glavne riječi:** minimalno invazivno brušenje; estetske Ljuske

#### IZAZOVI U TRETMANU PARCIJALNO BEZUBOG PACIJENTA S PREDNJIM KRIŽNIM ZAGRIZOM

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**Svrha:** Prednji križni zagriz najčešće je povezan s nesposobnošću žvakanja, neprikladnim foniranjem i nepovoljnim izgledom. Cilj ovog prikaza slučaja je otkriti da je točna procjena vertikalne okluzijske dimenzije ključna za dobru rehabilitaciju.

**Materijali i metode:** U ovom prikazu slučaja opisan je 56-godišnji muškarac koji je imao nekoliko karakteristika kolapsa ugriza, smanjenje vertikalne okluzijske dimenzije, tendenciju da se zubi kreću jedni prema drugima kako se troše. Pripremni aspekti uključivali su smanjenje više od 1,5 mm lingvalne površine gornjih zuba i suprotno u donjoj čeljusti, a ta se filozofija smanjenja dogodila kako bi se oporavila optimalna okluzija.

**Rezultati:** Okluzijska prekrivna oplata isporučena je nakon analize povećane vertikalne dimenzije analizirane fiziološkim i facijalnim mjerenjima i anatomskim pokazateljima. **Zaključak:** Slučaj pokazuje da je zadovoljavajući funkcionalni i estetski ishod postignut kao rezultat preuređenja vertikalne okluzijske dimenzije.

**Glavne riječi:** parcijalno bezubi pacijent; prednji križni zagriz

#### UTJECAJ OKLUZALNE SCHEME KOD POTPUNIH PROTEZA NA KVALITETU ŽIVOTA POVEZANU S ORALNIM ZDRAVLJEM – LINGVALIZIRANA NASUPROT BILATERALNE BALANSIRANE OKLUZIJE

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**Svrha:** Jedan od glavnih ciljeva u terapiji potpunim protezama je uspostava okluzije. Ne postoji jedinstven stav o okluzalnoj shemi korištenoj pri izradi potpunih proteza. Okluzalna shema koja se koristi u terapiji može utjecati na opće zadovoljstvo pacijenta potpunim protezama. Cilj ovog istraživanja bio je usporediti utjecaj dvaju okluzalnih koncepta korištenih pri izradi potpunih proteza, lingvalizirane okluzije i bilateralne uravnotežene okluzije na kvalitetu života bezubih pacijenata.

**Materijali i metode:** U ovom randomiziranom kliničkom ispitivanju sudjelovalo je 16 pacijenata kojima su izrađene nove potpune proteze. Nove potpune proteze izrađene su na osnovu dva različita okluzijska koncepta (9 pacijenata je dobilo potpune proteze s lingvaliziranim okluzijom, a 7 pacijenata je dobilo nove potpune proteze s bilateralno uravnoteženom okluzijom). Mjesec dana nakon predaje proteza, svi pacijenti su ispunili OHIP-14. Odgovor za svako pitanje prikazan je Likertovim tipom skale kao 0 - nikad, 1 - gotovo nikada, 2 - povremeno, 3 - prilično često, i 4 - vrlo često. Podaci su analizirani pomoću statističkog programa SPSS 18 koristeći t test za nezavisne uzorke.

**Rezultati:** Pacijenti koji su nosili potpune proteze s bilateralno uravnoteženom okluzijom imali su u ukupnom rezultatu OHIP-14 u prosjeku 0,25 boda više u usporedbi s pacijentima koji su nosili potpune proteze s lingvaliziranim okluzijom. Uspokos tome, taj okluzalni koncept nije pokazao niti klinički niti statistički značajnu razliku u zadovoljstvu pacijenata u odnosu na pacijente sa lingvaliziranim konceptom okluzije.

**Zaključak:** Rezultati ovog randomiziranog kliničkog ispitivanja pokazuju da okluzalna shema nema utjecaj na zadovoljstvo pacijenata sa svojim novim potpunim protezama.

**Glavne riječi:** okluzalna shema; potpuna proteza; kvaliteta života



## IMPLANT-RETAINED OVERDENTURE IN GERIATRIC PATIENT: A CLINICAL REPORT

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**Aim:** Tooth loss greatly diminishes the quality of life in geriatric patients. Besides functional and aesthetic deficiency, psychosocial life is affected as well. Conventional substitutes, i.e. full dentures, often cannot meet patient's expectations, therefore implant prosthodontics enables satisfying retention, stabilization, function and aesthetics.

**Materials and methods:** This case report presents oral rehabilitation with two-implant-retained mandibular overdenture using ball attachment. Patient in the age of 70 years came for examination to our clinical department. He was not satisfied with the existing removable dentures, especially the lower one. Several possibilities of oral rehabilitation with advantages and disadvantages were explained to the patient, based on the clinical and radiograph examinations and patient desires, after which he opted for two-implant-retained mandibular overdenture. Two Ankylos c/x implants (3.5×11 mm; 3.5×9.5mm) were placed in anterior area of mandible. After the end of the period of osseointegration, the prosthetic part of the therapy can be continued. The fabrication of the metal framework with ball attachment was planned based on prior arrangement of the artificial teeth. Internal adaptation and occlusal adjustments were performed on the day of insertion of finalized denture and instructions about maintenance and sanitation also.

**Results:** The patient showed satisfaction with the final result of his treatment, and no major complications were observed during this period. The treatment obtained better retention and stability of the complete denture and improved function and phonation.

**Conclusion:** Implant-retained complete overdenture provides better quality of life for patients in geriatric age.

**Key words:** implant-retained overdenture; geriatric patient

## MINI DENTAL IMPLANTS IN STRATEGIC POSITIONS AS ADDITIONAL SUPPORT OF REMOVABLE PARTIAL DENTURES - THE 2-YEARS LONGITUDINAL STUDY

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**Aim:** Most patients without all posterior teeth are mostly treated with removable partial dentures (RPDs) retained by clasps or attachments, but treatment possibilities for the Kennedy Class I patients include more different options: implant retained or implant assisted RPDs or fixed partial dentures on implants. Placement of standard size implants for retention and better stability of RPDs has already shown benefits. However, no studies have been conducted on whether slim implant (Mini dental implants, MDIs) can be used for better retention and stability of long saddle RPDs and what long-term effects would such treatment provide. The aim of this study was to evaluate clinical and radiographic performance of MDIs in strategic positions to retain and support RPDs.

**Materials and Methods:** A convenience sample of 52 patients of Kennedy Class I without all posterior teeth providing only linear support to a denture with slim alveolar ridges (<5 mm) were included. Two MDIs (2.0-2.5 mm wide, 10-14 mm long) inserted adjacent to the last tooth or at one-tooth width posteriorly changed linear into more favorable polygonal denture support. The marginal bone loss (MBL) at the mesial and distal side was assessed on periapical and/or panoramic radiographs. Implant success and survival rates, technical difficulties and patient centered outcomes were assessed. Patients filled in 3 questionnaires: OHIP14, chewing function questionnaire (CFQ) and orofacial esthetic scale (OES) at baseline, at the one-year control exam, and in 36 patients at the 2-years appointment.

**Result:** Four implants were lost before loading, but were substituted, one failed again and that patient was excluded, finally 128 implants were loaded (97.4% surgical success). Three patients lost one MDI each after 1 year in the maxilla. Four MDIs were further lost in the maxilla and three in the mandible after 2 years. The survival rate of loaded implants was 92%, total survival rate 91.2% (2.8% early implant loss + 6% late implant loss). At the 1-year follow-up MBL ranged from 0.0 - 1.8 mm; at the 2-years from 0.0 - 2.4 mm (36 patients). No denture fractures were reported. At the 1<sup>st</sup> year examination 2 matrix and 4 o-rings were lost and replaced; at the 2<sup>nd</sup> year examination 3 more matrices and 8 o-rings were lost and replaced. After the treatment the OHRQoL, aesthetics and chewing function significantly improved and remained consistent.

**Conclusion:** The MDI retained RPD is a feasible treatment option in partially edentulous patients with slim alveolar ridges, however more years of observation are necessary to approve the protocol.

**Key words:** mini dental implants; removable partial dentures

## POKROVNA PROTEZA NA IMPLANATIMA KOD GERIJATRIJSKOG PACIJENTA: PRIKAZ SLUČAJA.

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**Svrha:** Gubitak zuba uvelike umanjuje kvalitetu života kod pacijenata gerijatrijske dobi. Pored manjkavosti funkcije i estetike, utječe i na psihosocijalni život. Konvencionalni namjesci, npr. potpune proteze, često ne ispunjavaju očekivanja pacijenta, stoga implantoprotetika omogućuje zadovoljavajuću retenciju, stabilizaciju, funkciju i estetiku.

**Materijali i metode:** U ovom prikazu slučaja prezentirana je oralna rehabilitacija pokrovnom protezom retiniranom na dva implantata sa kuglom kao etečmenom. Pacijent u dobi od 70 godina došao je na pregled u naš klinički Odjel. Nije bio zadovoljan sa postojećim protezama, posebno sa donjom. Nekoliko mogućnosti oralne rehabilitacije sa prednostima i nedostacima prezentirano je pacijentu, na temelju kliničkog pregleda, radiološke dijagnostike i pacijentovih želja, nakon čega se on odlučio za pokrovnu protezu retiniranu na dva implantata. Dva Ankylos c/x implantata (3.5×11 mm; 3.5×9.5mm) postavljena su u prednji dio donje čeljusti. Nakon završenog razdoblja osseointegracije, moglo se nastaviti sa protetskim dijelom terapije. Izrada metalnog skeleta proteze sa kugličnom vezom planirana je na temelju položaja umjetnih zuba u prethodnoj protezi. Prilikom predaje gotove proteze napravljeno je prilagođavanje proteze i okluzijsko ubrušavanje, a isto tako dane su i upute o održavanju i higijeni.

**Rezultati:** Pacijent je bio zadovoljan krajnjim rezultatom terapije, tijekom koje nisu zabilježene veće komplikacije. Postignuta je bolja retencija i stabilnost potpune proteze te poboljšana funkcija i fonacija.

**Zaključak:** Pokrovnna proteza retinirana implantatima omogućuje bolju kvalitetu života pacijenata u gerijatrijskoj dobi

**Ključne riječi:** pokrovnna proteza; implantati; kvaliteta života

## MINI DENTALNI IMPLANTATI NA STRATEŠKIM POZICIJAMA KAO DODATNA POTPORA DJELOMIČNIM PROTEZAMA - DVOGODIŠNJE PRAĆENJE

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**Svrha:** Terapija za većinu djelomično ozubljenih osoba bez zuba u posteriornoj regiji je izrada djelomičnih proteza (DP) retiniranih kvačicama ili kopčama, međutim mogućnosti terapije Kennedy klase I su različite: DP retinirane ili poduprte implantatima ili fiksni most na implantatima. Podaci o implantatima standardnih dimenzija za retenciju i potporu djelomičnih proteza su već poznati u literaturi, međutim dosad nisu provedena nikakva istraživanja o tomu može li se uski implantati (mini dentalni implantati, MDI) koristiti za poboljšanje retencije i stabilnost DP produženih sedala i kakvi će biti dugoročni učinci takva oblika terapije. Cilj ovog istraživanja je bio procijeniti kliničke i radiografske parametre MDI postavljenim na strateškim pozicijama za retenciju i stabilizaciju DP. Materijali i metode: U istraživanje su bila uključena 52 pacijenta Kennedy klase I bez zuba u posteriornoj regiji (linearna potpora protezama) i uskim alveolarnim grebenima (<5 mm). Dva MDI (2.0-2.5 mm širine, 10-14 mm dužine) su bila postavljena distalnije od zadnjeg zuba u zubnom nizu i to odmah pokraj ili otprilike za širinu jednog zuba distalnije od zadnjeg zuba, pretvarajući linearno u povoljnije poligonarno podupiranje. Gubitak kosti zabilježen je s mezijalne i distalne strane implantata na periapikalnim i/ili panoramskim rendgenskim snimkama. Procijenjeni su uspjeh i stopa preživljavanja implantata, tehničke komplikacije i ishodi terapije od strane pacijenta. Pacijenti su ispunili 3 upitnika. OHIP 14, upitnik žvakanja i orofacijsku estetsku skalu (OES) prije terapije te na kontrolnom pregledu nakon jedne godine i nakon 2 godine (36 pacijenta).

**Rezultati:** Četiri implantata su izgubljena prije opterećenja, ali su zamijenjena, a jedan je ponovno izgubljen te je taj pacijent bio isključen; ukupno je opterećeno 128 implantata (97.4% kirurški uspjeh). Tri pacijenta su izgubila po jedan MDI nakon 1 godine u gornjoj čeljusti. Četiri MDI su dalje izgubljena u maksili i tri u mandibuli nakon 2 godine. Stopa preživljavanja implantata iznosila je 92%, a ukupna stopa preživljavanja 91.2% (2.8% rani gubitak implantata + 6% kasni gubitak implantata). Nakon prve godine gubitak kosti oko implantata se kretao od 0.0 - 1.8 mm; nakon 2 godine od 0.0 - 2.4 mm (36 pacijenata). Nisu zabilježeni lomovi proteza. Nakon prve godine praćenja 2 matrice i 4 O-ringa su izgubljena i zamijenjena; nakon dvije godine izgubljene i zamijenjene su još 3 matrice i 8 O-ringa. Nakon terapije značajno su se poboljšali OHRQoL, estetika i funkcija žvakanja te su ostali takvi tijekom vremena.

**Zaključak:** DP retinirane MDI su moguća terapijska opcija kod djelomično bezubih pacijenata sa uskim alveolarnim grebenima, no kako bi se odobrio protokol potrebna su longitudinalna dugoročna praćenja.

**Ključne riječi:** mini dentalni implantati; djelomična proteza

## INFLUENCE OF OCCLUSAL TREATMENT ON SALIVARY OXIDATIVE STATUS IN CHRONIC TMD PATIENTS

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**Aim:** Evidence suggest that altered salivary oxidative status (OS) plays role in pathogenesis of temporomandibular disorders (TMD). When comparing to healthy individuals, differences in OS of TMD patients were found. Due to unknown etiology, heterogeneity of disorders and tendency to chronicity, conservative approach is the first, and often the only, treatment option for TMD. Aim was to follow up changes in OS and salivary cortisol (SC) in chronic TMD patients treated with occlusal splints over 3 months.

**Materials and Methods:** Twelve female patients, diagnosed with chronic TMD, were classified in high (HIP)/low (LIP) intensity pain group. Total antioxidant capacity (TAC), malondialdehyde (MDA), superoxide dismutase (SOD) and salivary cortisol (SC) were analyzed using spectrophotometry. Treatment outcomes included spontaneous pain [visual analogue scale (VAS)], maximal comfortable mouth opening, self-perceived quality of life (OHIP-14) and level of perceived stress (PSS). Repeated measures ANOVA (baseline, 1st and 3rd month) and Spearman's correlation tests were used for data analysis.

**Results:** Salivary TAC significantly increased ( $p=0.044$ ). Significant reduction of MDA ( $p=0.021$ ), and the decrease of MDA/SOD ratio ( $p=0.017$ ) was observed in HIP patients. Reduction of VAS ( $p=0.001$ ) and mean OHIP-14 ( $p=0.007$ ) scores were significant, but independent of the pain intensity. At baseline, higher PSS was significantly associated with higher SC. Significant correlation between reduction of morning SC and decrease of perceived stress was found in LIP patients ( $p=0.94$ ).

**Conclusion:** During 3 month treatment reduction of antioxidant TAC was accompanied with the decrease in pro-oxidant MDA, and oxidant/antioxidant (MDA/SOD) ratio in patients with HIP. This observed decrease of MDA/SOD ratio imply that during splint therapy the scavenging capacity of free radicals increases. The decrease of TAC might indicate biological principles of avoiding unnecessary processes, once the increase in antioxidants effectively compensates the oxidative stress.

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**Key words:** occlusal treatment; salivary oxidative status; TMD

## UTJECAJ TERAPIJE OKLUZIJSKOM UDLAGOM NA SALIVARNI OKSIDATIVNI STATUS PACIJENATA S KRONIČNIM TEMPOROMANDIBULARNIM POREMEĆAJIMA

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**Svrha:** Dokazi upućuju da oksidativni stres (OS) ima ulogu u patogenezi temporomandibularnih poremećaja (TMP). Pronađene su značajne razlike u koncentracijama biljega OS između zdravih pojedinaca i pacijenata s TMP-om. Zbog nepoznate etiologije, heterogenosti poremećaja i tendencije prelaska u kronicitet, prvi i često jedini odabir u liječenju je konzervativna terapija. Cilj ove studije bio je pratiti promjene u OS i salivarnom kortizolu (SK) u pacijenta s kroničnim TMP liječenih okluzijskom udlagom tijekom 3 mjeseca. Materijali i metode: Dvanaest pacijentica, kojima je dijagnosticiran TMP, podjeljeno je u dvije skupine ovisno intenzitetu boli [visoki (VIB)/niski (NIB)]. Uz pomoć spektrofotometrije iz sline su analizirani ukupni antioksidativni kapacitet (TAC), malondialdehid (MDA), superoksid dismutaza (SOD) i SC. Mjere ishoda uključivale su spontanu bol [prema vizualno analognom ljestvici (VAS)], maksimalno bezbolno otvaranje usta, kvalitetu života ovisnu o oralnom zdravlju (OHIP-14) i razinu percipiranog stresa (PSS). Za statističku analizu korišteni su ANOVA ponovljenih mjerenja (prvi pregled, 1. i 3. mjesec liječenja), te Spearmanov test korelacije.

**Rezultati:** Tijekom terapije udlagom došlo je do značajnog pada koncentracije TAC-a ( $p=0.044$ ). U VIB skupini značajno su se smanjile koncentracije MDA ( $p=0.021$ ) i omjer MDA/SOD ( $p=0.017$ ). Iznos boli prema VAS ( $p=0.001$ ), te zbroj bodova upitnika OHIP-14 ( $p=0.007$ ) značajno su sniženi u obje skupine. Prije početka liječenja viši PSS je bio značajno povezan s višim razinama SK-a. U NIB skupini pronađena je značajna korelacija između postotne promjene SK-a i smanjenja PSS-a ( $p=0.94$ ).

**Zaključak:** Tijekom tromjesečne terapije smanjenje TAC-a u ispitanika s višim intenzitetom boli bilo je popraćeno smanjenjem oksidansa MDA, ali i omjera između oksidansa MDA i antioksidansa SOD. Ovo opaženo smanjenje MDA/SOD omjera implicira da se tijekom terapije udlagom povećava sposobnost uklanjanja slobodnih radikala, a kako bi konstantno održavanje visokih razina TAC-a bio nepotreban utrošak energije, TAC se posljedično smanji. Na taj način kompenziran je OS.

**Ključne riječi:** okluzijska udlaga; salivarni oksidativni status; temporomandibularni poremećaj

## PREVALENCE OF BRUXISM IN STUDENTS AT THE UNIVERSITY OF SPLIT SCHOOL OF MEDICINE

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**Aim:** Prevalence of bruxism in student population is increasing, as well as stress which is considered one of its major etiological factors. (1, 2). The aim of this study was to assess the prevalence of bruxism and stress among students.

**Materials and methods:** This study involved students from the three integrated studies at the University of Split School of Medicine. Participants completed a questionnaire that combined questions about the presence / absence of bruxism based on the Fonnseca's questionnaire, questions about the level of stress that students are exposed to (Girdano and associates), as well as questions about origins of stress based on the questionnaire of Psychological Counseling Center of the University of Rijeka.

**Results:** A total of 691 participants, 497 female students and 194 male students, completed a questionnaire. The results of this study showed the prevalence of bruxism being 41.4% with higher prevalence among female students (31.4%). There was also a difference in the prevalence of bruxism between different study years, with 41.35% in the first year, 37.4% in the second year, 37.1% in the third year, 39.6% in the fourth year, 51% in the fifth year, and 44.1% in the sixth year. 62.1% of students reported being within normal stress levels, while 37.8% reported high stress levels. During the first three years of study results showed the largest number of students with bruxism, and were within high levels of stress.

**Conclusion:** The prevalence of bruxism among students is high, and is more common among female students. The highest prevalence of bruxism occurs during the fifth study year. Most students are exposed to normal stress levels, while more than a third of students are exposed to high levels of stress. There is a correlation between stress and bruxism, whereas high levels of stress are accompanied with a higher frequency of bruxism.

**Key words:** bruxism; students

## UČESTALOST BRUKSIZMA U STUDENATA MEDICINSKOG FAKULTETA SVEUČILIŠTA U SPLITU

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**Svrha:** Učestalost bruksizma u studentskoj populaciji raste, kao i stres, koji je jedan od glavnih etioloških čimbenika bruksizma. Cilj ovog istraživanja bio je procijeniti učestalost bruksizma i stresa među studentima.

**Materijali i metode:** U istraživanju su sudjelovali studenti triju integriranih studija Medicinskog fakulteta Sveučilišta u Splitu, ispunjavanjem anketnog upitnika koji se sastojao od tri skupine pitanja: pitanja o prisutnosti/odsutnosti bruksizma na temelju Fonnseca upitnika o bruksizmu i poremećajima temporomandibularnih zglobova, pitanja o doživljenoj razini stresa temeljenih na upitniku Girdina i suradnika te pitanja o izvorima stresa temeljena na upitniku Psihološkog savjetodavničkog centra riječkoga Sveučilišta.

**Rezultati:** Ukupno 691 ispitanik, od kojih 497 studentica i 194 studenta, ispunio je anketni upitnik. Učestalost bruksizma je iznosila 41,4% s većom učestalošću u studentica (31,4%). Učestalost bruksizma na prvoj godini studija iznosi 41,35%, na drugoj 37,4%, na trećoj 37,1%, na četvrtoj 39,6%, na petoj 51% i na šestoj godini 44,1%. Normalnu razinu stresa navodi 62,1% studenata dok je 37,8% studenata pod visokom razinom stresa. Tijekom prvih triju godina studija najveći broj studenata koji imaju bruksizam navode visoku razinu stresa.

**Zaključak:** Učestalost bruksizma među studentima je visoka, i to više među studenticama. Bruksizam je najčešći na petoj godini studija. Većina studenata je izložena normalnoj razini stresa, dok je nešto više od trećine studenata izloženo visokoj razini stresa. Postoji povezanost stresa i bruksizma pri čemu visoka razina stresa prati i veću učestalost bruksizma. **Ključne riječi:** bruksizam; studenti Medicinskog fakulteta

## OROFACIAL SYMPTOMS IN PATIENTS WITH MULTIPLE SCLEROSIS

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**Aim:** Multiple sclerosis (MS) is a chronic autoimmune demyelinating disease of the central nervous system affecting the sensory and motor nervous conduction. The disease may also have manifestations in the orofacial region. The aim of this study was to determine the prevalence of orofacial symptoms in the group of patients with multiple sclerosis and to investigate the correlation of the symptoms with the disease parameters.

**Materials and Methods:** The study included 33 patients with MS (24 women and 9 males, mean age 56.30 ± 9.16) and 33 healthy subjects who did not suffer from MS (24 women and 9 males, mean age 57.56 ± 9.02). Participants filled out a questionnaire about the occurrence of orofacial symptoms, and the patients with MS were also asked about the duration and type of disease.

**Results:** MS patients have more orofacial symptoms than the control subjects. The most frequent orofacial symptoms in the MS patients compared to the control subjects were: dry mouth (54.5% vs. 27.5%;  $p=0.86$ ), swallowing problems (42.4% vs. 3.3%;  $p<0.001$ ), impaired speech (42.4% vs. 0%;  $p=0.0001$ ), taste change (36.3% vs. 3.3%;  $p<0.001$ ), cramps in the face and mouth (27.2% vs. 0%;  $p=0.004$ ), pain in the mouth (21.2% vs. 3.3%;  $p=0.02$ ), temporomandibular joint pain (21.2% vs. 0%;  $p=0.01$ ) face pain (18.1% vs. 0%;  $p=0.03$ ) and burning in the mouth (12.1% vs. 3.3%;  $p=0.162$ ). There was no statistically significant correlation between the number of orofacial symptoms and MS duration ( $r=0.16$ ;  $p>0.05$ ).

**Conclusion:** Patients with multiple sclerosis have significantly more orofacial symptoms, but the number of symptoms does not correlate with the duration of disease.

**Key words:** multiple sclerosis; orofacial symptoms

## OROFACIJALNI SIMPTOMI U BOLESNIKA S MULTIPLOM SKLEROZOM

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**Svrha:** Multipla skleroza (MS) je kronična autoimuna demijelinizacijska bolest središnjeg živčanog sustava koja utječe na senzoričku i motoričku živčanu provodljivost. Bolest može imati očigledna i u orofacijalnoj regiji. Cilj ovog rada bio je utvrditi pojavnost orofacijalnih simptoma u skupini bolesnika s multiplom sklerozom te utvrditi korelaciju simptoma s parametrima bolesti.

**Materijali i metode:** U ispitivanju je sudjelovalo 33 bolesnika s MS-om (24 žena i 9 muškaraca, prosječne dobi 56,30±9,16) i 33 kontrolnih zdravih ispitanika koji nisu bolovali od MS-a (24 žena i 9 muškaraca, prosječne dobi 57,56±9,02). Ispitanici su ispunili upitnik o pojavnosti orofacijalnih simptoma, a bolesnici s MS-om ispitani su i o trajanju i tipu bolesti.

**Rezultati:** Bolesnici s MS-om imaju više orofacijalnih simptoma nego kontrolni ispitanici. Najučestaliji orofacijalni simptomi u bolesnika s MS-om u odnosu na kontrolne ispitanike bili su: suha usta (54,5% vs. 27,5%;  $p=0,86$ ), problemi s gutanjem (42,4% vs. 3,3%;  $p<0,001$ ), otežani govor (42,4% vs. 0%;  $p=0,0001$ ), promjena osjeta okusa (36,3% vs. 3,3%;  $p<0,001$ ), grčevi i trnci u području lica i usta (27,2% vs. 0%;  $p=0,004$ ), bolovi u ustima (21,2% vs. 3,3%;  $p=0,02$ ), bolovi temporomandibularnog zgloba (21,2% vs. 0%;  $p=0,01$ ), bolovi lica (18,1% vs. 0%;  $p=0,03$ ) i pečenje u ustima (12,1% vs. 3,3%;  $p=0,162$ ). Nije utvrđena statistički značajna korelacija između broja orofacijalnih simptoma i trajanja MS-a ( $r=0,16$ ;  $p>0,05$ ).

**Zaključak:** Bolesnici s multiplom sklerozom imaju značajno više orofacijalnih simptoma, ali broj simptoma ne korelira s trajanjem bolesti.

**Cljučne riječi:** multipla skleroza; orofacijalni simptomi

## PREVIOUS MEDICAL EXPERIENCE AND DENTAL ANXIETY IN CHILDREN

Leko J

Private Dental Practice, Slavonski Brod

**Aim:** The aetiology of dental anxiety in children is complex but it is considered that previous medical experiences could play an important role. The aim of this study was to assess the relationship between previous medical experiences and the level of dental anxiety. The aim was also to assess reliability and validity of MCDAS-f test in the Croatian sample. **Materials and Methods:** The samples comprised 202 children aged from 5 – 12 years (97 boys and 105 girls). Children's dental anxiety was assessed by two scales: Children's Fear Survey Schedule - Dental Subscale (CFSS-DS) and Modified Child Dental Anxiety Scale – faces version (MCDAS-f). Fear of medical experiences was assessed by Broome's Child's Medical Fear Questionnaire (CMFQ).

**Results:** Children's medical fear showed strong association with dental anxiety assessed by CFSS-DS ( $r = 0,678$ ;  $P < 0,01$ ) and by MCDAS-f ( $r = 0,394$ ;  $P < 0,01$ ). The internal consistency of this scale displayed the highest Cronbach's  $\alpha$  coefficient ( $\alpha = 0,90$ ). The average MCDAS-f value for cooperative children was 20,20, and 30,73 for children with fear and behaviour management problem ( $P < 0,001$ ). The Cronbach's  $\alpha$  showed good reliability of MCDAS-f ( $\alpha = 0,73$ ).

**Conclusion:** The findings show that child's medical fear plays an important role in the aetiology of dental fear in children. Both CFSS-DS and MCDAS-f represents highly reliable and suitable assessment tools in quantifying dental fear in children. MCDAS-f is more suitable and simpler to administer in assessing dental anxiety in younger children.

**Key words:** child dental anxiety; aetiology; assessment

## PRIJAŠNJE MEDICINSKO ISKUSTVO I DENTALNA ANKSIOZNOST U DJECE

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**Uvod:** Etiologija dentalne anksioznosti u djece je kompleksna, ali se smatra da prijašnje medicinsko iskustvo u tome može igrati važnu ulogu. Cilj ovog istraživanja je bio procijeniti odnos između prijašnjeg medicinskog iskustva i razine dentalne anksioznosti. Cilj je također bio procijeniti pouzdanost i valjanost MCDAS-f testa na hrvatskom uzorku djece. **Materijali i metode:** Uzorak je činilo 202 djece u dobi od 5 – 12 godina (97 dječaka i 105 djevojčica). Dentalna anksioznost djece procijenjena je pomoću dvije skale: Children's Fear Survey Schedule - Dental Subscale (CFSS-DS) i Modified Child Dental Anxiety Scale – faces version (MCDAS-f). Strah od medicinskog iskustva procijenjen je pomoću Broome's Child's Medical Fear Questionnaire (CMFQ).

**Rezultati:** Medicinski strah u djece pokazao je snažnu povezanost s dentalnom anksioznosti procijenjenom pomoću CFSS-DS ( $r = 0,678$ ;  $P < 0,01$ ) i MCDAS-f ( $r = 0,394$ ;  $P < 0,01$ ). Unutarnja konzistentnost skale CFSS-DS pokazala je visoki Cronbachov  $\alpha$  koeficijent ( $\alpha = 0,90$ ). Prosječna MCDAS-f vrijednost za kooperativnu djecu bila je 20,20, i 30,73 za djecu sa strahom i problemom ponašanja ( $P < 0,001$ ). Cronbachov  $\alpha$  koeficijent pokazao je dobru pouzdanost MCDAS-f skale ( $\alpha = 0,73$ ).

**Zaključak:** Rezultati pokazuju da medicinski strah u djece igra važnu ulogu u etiologiji dentalne anksioznosti. Oba instrumenta CFSS-DS i MCDAS-f predstavljaju pouzdane i prikladne mjere za kvantifikaciju dentalnog straha u djece. MCDAS-f je prikladniji i jednostavan za primjenu u procjeni dentalne anksioznosti mlađe djece.

**Cljučne riječi:** dentalna anksioznost u djece; etiologija; procjena

## PRESCRIPTION OF ANTIBIOTICS IN CROATIA DURING A PERIOD OF THREE YEARS

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## PROPIŠIVANJE ANTIBIOTIKA U ORDINACIJAMA DENTALNE MEDICINE U REPUBLICI HRVATSKOJ U TROGODIŠNJE RAZDOBLJE

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**Aim:** To investigate prescribing of antibiotics in primary dental care in Croatia.

**Materials and methods:** The data were collected from the Central Information Health System of Croatia and presented through descriptive statistics. To explore the frequency of prescription, the number of prescribed antibiotics was compared to the number of people in each county. The frequency of antibiotics prescription was then compared using the z-test for proportions with Bonferroni post-hoc adjustment ( $\alpha=0.05$ ).

**Results:** From 1<sup>st</sup> 2015 January until December 31<sup>st</sup> 2017, in primary public dental health care in Croatia 1.080.808 antibiotics were prescribed. Average prevalence of antibiotic prescription in one year, expressed as ratio of number of antibiotics prescribed to overall population was 8.4%. The yearly average value of antibiotic prescriptions per capita in individual counties was between 6.3%-11.2%, with the lowest percentage in Primorsko-Goranska County (6.3%), and the highest percentage in Bjelovarsko-Bilogorska County (11.2%). The most frequently prescribed antibiotic, in 54.6% of cases, was amoxicillin with clavulanic acid, followed by amoxicillin (13.8%), clindamycin (12.6%), and metronidazole (10.1%). Most frequent diagnosis for antibiotic prescription was periapical periodontitis. Antibiotics were prescribed in cases in which there was no indication for antibiotic use, i.e. caries (3.2%), pulpitis (5.5%). Regarding the age, the highest percentage of antibiotics was prescribed for the age group between 20 and 29 years (11.3%) with a continuous decline in frequency towards the older age groups.

**Conclusion:** The results showed inconsistencies of antibiotic prescriptions within different counties, along with unnecessary prescribing of antibiotics in cases with no indications.

**Key words:** antibiotics; primary dental care

#### DESCENDING NECROTIZING MEDIASTINITIS AS A COMPLICATION OF ODONTOGENIC INFECTION: A CASE REPORT

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**Aim:** Necrotizing mediastinitis as a complication of odontogenic infection is a serious life-threatening infection with high mortality rate (25-40%). We present a case of 26-year-old male presented with necrotizing fasciitis and mediastinitis as a consequence of pterygomandibular abscess from odontogenic infection.

**Materials and methods:** Our patient presented with a sublingual abscess as a complication of periapical process on tooth 37. After intraoral incision and drainage performed by an oral surgeon, on day 4 the patient was admitted to our hospital for further treatment. Broad-spectrum antibiotic therapy was continued. MSCT revealed a propagation of infection to submandibular, parapharyngeal and pretracheal space with bilateral pleural effusion and therefore an urgent tracheotomy with bilateral neck drainage was performed. Hemodynamic and respiratory stability was sustained. The next-day MSCT showed an infection-affected mediastinum and right thoracotomy and chest drainage was indicated. ICU parameters: mechanically ventilated in SIMV/BiPAP mode with FiO<sub>2</sub> of 0.35, CRP 353, WBC 12000, subfebrile (38.5 °C). Microbiological analysis showed *Citrobacter koseri*, *Staphylococcus spp.* - coagulase negative and *Streptococcus species (viridans)*. Initial antibiotic therapy consisted of crystal penicillin, garamycine and metronidazole was replaced by piperacilline-tazobactam and clindamycin. On day 5 after thoracotomy chest tubes were repositioned due to impressive right pleural effusion and on day 11 after ICU admission inflammatory parameters returned to normal (CRP 37.9) and chest tubes were removed. On day 12 after ICU admission patient was discharged from ICU.

**Results:** After 12 days of ICU stay, aggressive antibiotic therapy and multiple surgical interventions, patient fully recovered without consequences. Our case showed that timely decisions are crucial in reducing high mortality rate of mediastinitis as a consequence of odontogenic infection.

**Conclusion:** Odontogenic infection is a cause of mediastinitis in up to 72% of cases. Incidence of mediastinitis as a consequence of necrotizing fasciitis is quite rare and only sporadic cases are reported (5,6,7). Early diagnosis based on clinical, laboratory and radiological findings and followed by aggressive antibiotic treatment and surgical treatment are of utmost importance in reducing mortality, which occurs as a consequence septic shock.

**Key words:** odontogenic infection; descending necrotizing mediastinitis

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**Svrha:** Istražiti propisivanje antibiotika na recept u primarnoj dentalnoj zdravstvenoj zaštiti u Republici Hrvatskoj.

**Materijali i metode:** Prikupljeni podatci iz Centralnog zdravstvenog informacijskog sustava Republike Hrvatske (CEZIH-a) obrađeni su i prikazani deskriptivnom statistikom. Kako bi se istražila učestalost primjene antibiotika uspoređeno je propisivanje antibiotika po županijama u odnosu na broj stanovnika. Frekvencije su uspoređene z-testom za proporcije s Bonferroni korekcijom za višestruke usporedbe, uz  $\alpha=0.05$ .

**Rezultati:** U razdoblju od 01.01.2015. do 31.12.2017. u okviru primarne dentalne zdravstvene zaštite u Republici Hrvatskoj propisano je na recept sveukupno 1.080.808 antibiotika. Prosječna učestalost propisivanja antibiotika u jednoj godini, izražena kao udio broja antibiotika u odnosu na ukupan broj stanovnika, iznosila je 8,4%. Prosječne učestalosti propisivanja antibiotika po pojedinim županijama iznosile su od 6,3% - 11,2%, s najnižim postotkom u Primorsko-Goranskoj županiji (6,3%), a najvećim u Bjelovarsko-Bilogorskoj (11,2%). Najčešće propisani antibiotik bio je amoksicilin s klavulonskom kiselinom (54,6%). Slijede amoksicilin (13,8%), klindamicin (12,6%), te metronidazol (10,1%). Najčešća dijagnoza za koju je propisan antibiotik bio je periapikalni parodontitis (36,5%). Antibiotici su se propisivali i za dijagnoze kod kojih nema indikacija za propisivanje istih, kao što su npr. karijes (3,2%), pulpitis (5,5%). S obzirom na dob, najveći postotak antibiotika propisan je za dobnu skupinu od 20-29 godina (11,3%), s tendencijom pada postotka prema starijim dobnim skupinama.

**Zaključak:** Rezultati istraživanja pokazuju neujednačenost u učestalosti propisivanja antibiotika u ordinacijama dentalne medicine među županijama Republike Hrvatske, uz nepotrebno propisivanje antibiotika za dijagnoze u kojima nisu indicirani.

**Ključne riječi:** antibiotici; primarna dentalna zdravstvena zaštita

#### DESCEDENTNI NEKROTIZIRAJUĆI MEDIJASTINITIS KAO KOMPLIKACIJA ODONTOGENE UPALE

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**Svrha:** Nekrotizirajući medijastinitis koji nastaje kao posljedica odontogene infekcije je ozbiljno životno ugrožavajuće stanje sa visokim mortalitetom (25-40%). Prikazujemo slučaj 26-godišnjeg muškarca sa nekrotizirajućim fasciitisom i medijastinitisom kao posljedica pterygomandibularnog apscesa od odontogene upale.

**Materijali i metode:** Bolesnik se prezentirao sa sublingualnim apscesom koji je nastao kao posljedica periapikalnog procesa zuba 37. Četvrtog dana nakon intraoralne incizije i drenaže od strane oralnog kirurga, bolesnik se prima u našu bolnicu na daljnje liječenje. Po prijemu se nastavlja prethodno započeta terapija antibioticima širokog spektra. MSCT je pokazao širenje infekcije u submandibularni, parafaringealni i pretrahealni prostor sa obustranim pleuralnim izljevima te se učini hitna traheotomija sa bilateralnom drenažom vrata uz održanu hemodinamsku i respiratornu stabilnost. Ponovljeni MSCT je pokazao zahvaćanje medijastinuma te se učini desna torakotomija sa drenažom prsista. Bolesnik je u jedinici intenzivne medicine (JIM) bio ventiliran u SIMV/BiPAP modalitetu disanja, FiO<sub>2</sub>=0,35 sa CRP 353, leukocitima 12000 i subfebrilitetom do 38,5 °C. Mikrobiološki nalaz je pokazao da su *Citrobacter koseri*, *Staphylococcus spp.* - koagulaza negativan and *Streptococcus species (viridans)* uzročnici infekcije. Početna antibiotska terapija sa kristalnim penicilinom, garamicinom i metronidazolom je zamijenjena piperacilin/tazobaktamom i klindamicinom. Petog dana nakon torakotomije se repositionira torakalni dren zbog daljnje propagacije izljeva, a 11.dana nakon prijema u JIM upalni parametri se normaliziraju (CRP 37,9) te se ostanjuje torakalna drenaža. Dvanaestog dana po prijemu u JIM bolesnik se otpušta na odjel.

**Rezultati:** Nakon 12 dana boravka u JIM, agresivnog antibiotskog liječenja i multiplih kirurških intervencija, bolesnik se u potpunosti oporavio. Naš prikaz slučaja je pokazao kako su pravovremene terapijske odluke presudne u smanjivanju mortaliteta medijastinitisa koji nastaje kao posljedica odontogene upale.

**Zaključak:** Odontogena upala je uzrok medijastinitisa u do 72% slučajeva. Incidencija medijastinitisa kao posljedice nekrotizirajućeg fasciitisa je vrlo mala i prijavljuju se sporadični slučajevi. Rana dijagnoza temeljena na kliničkim, laboratorijskim i radiološkim nalazima, praćena agresivnim antibiotskim i kirurškim liječenjem je od presudne važnosti u smanjenju mortaliteta, koji nastaje kao posljedica septičnog šoka.

**Ključne riječi:** odontogena upala; descendentni nekrotizirajući medijastinitis



**DO DENTISTS AND PERIODONTISTS HAVE A ROLE IN MANAGING OBESITY? A CASE REPORT.**Musić L<sup>1</sup>, Jurlina D<sup>2</sup>, Čatović I<sup>3</sup>, Puhar I<sup>1</sup><sup>1</sup> Department of Periodontology, School of Dental Medicine University of Zagreb, Croatia<sup>2</sup> Faculty of Medicine, J.J. Strossmayer University of Osijek, Croatia<sup>3</sup> Private dental practice Dr. Čatović, Pula, Croatia

**Aim:** Obesity (BMI>30) is considered to be a major public health concern around the world and in Croatia, where it is estimated to affect 18,7% of the adult population. It has been suggested that obesity is associated with an increased susceptibility to periodontitis. This case report presents a 33-year old obese woman (BMI ~36) with generalized periodontitis stage III, grade C undergoing non-surgical periodontal treatment, and the role of the periodontist in health behaviour change.

**Materials and methods:** The woman, otherwise systemically healthy, was referred for ongoing severe gum bleeding, tooth migration and mobility. Clinical and radiographic examination revealed inflamed gingiva (FMBS 100%), inadequate oral hygiene (FMPS 83%), generalized pocketing up to 12mm of depth and bone loss up to the apical third. The attending periodontist addressed patient's obesity, explained the association between the two conditions and conducted a motivational interview to strengthen the intrinsic motivation and commitment to change. Non-surgical periodontal treatment was carried out quadrant-wise with the adjunctive administration of systemic antibiotics following treatment, and repeated OHI and re-motivation. At the time of the treatment, the patient enrolled in physical activity.

**Results:** Upon re-evaluation, patient presented reduction in periodontal pocket depths, gingival bleeding (PMBS 50%) and plaque (FMPS 20%) scores, yet there was a significant number of residual pockets, requiring corrective treatment. After 1 year, patient reported 10kg weightloss.

**Conclusions:** Dentists and periodontists should be aware of the importance of motivational interview and periodontal treatment in patients with obesity.

**Key words:** obesity; periodontitis

**ASSOCIATION OF NUTRITIONAL AND ORAL HYGIENE HABITS AND ORAL HEALTH IN SCHOOL CHILDREN**Reić T<sup>1</sup>, Galić T<sup>2</sup>, Milatić K<sup>1</sup>, Negovetić Vranić D<sup>3</sup><sup>1</sup> PhD student, School of Dental Medicine, University of Zagreb, Zagreb, Croatia<sup>2</sup> Department of Prosthetic Dentistry, Study of Dental Medicine, University of Split School of Medicine, Split, Croatia<sup>3</sup> Department of Paediatric Dentistry, School of Dental Medicine, University of Zagreb, Zagreb, Croatia

**Aim:** The aim of this study was to investigate the association of nutritional and oral hygiene habits and oral health in school children.

**Materials and Methods:** There were 143 children aged six to thirteen attending primary school Blato, Blato, Croatia who participated in this study. Children were divided in two groups: younger primary school children (6-9 years old, n=83) and older primary school children (10-13 years old, n=61). The study was conducted by using a questionnaire of oral-hygienic habits and clinical dental examination. Decayed-missed-filled tooth index (DMFT) and plaque index were calculated. DIAGNOdent pen was used to assess caries presence on the first permanent molars.

**Results:** The results of this study showed there were no statistically significant differences in the consumption of sugar and sweetened beverages between the tested groups. There were 124 (86,71%) children brushing their teeth one or more times a day. The DMFT index for older children (10-13 years, DMFT=2,66±2,45) was significantly higher ( $p < 0.001$ ) than the DMFT index in younger children (6-9 years, DMFT=1,08±1,36). There were no statistically significant differences in plaque index values between younger and older children in this study ( $p=0.119$ ), as well as the values obtained with the DIAGNOdent pen device (16-p=0,709; 26-p=0,902; 36-p=0,135; 46-p=0,257).

**Conclusion:** Results of this study showed that DMFT index is higher in older children than in younger children although their nutritional and oral hygiene habits were similar.

**Key words:** nutritional and oral hygiene habits; oral health; school children

**THE RELATIONSHIP BETWEEN THE PARENTAL ASSESSMENT OF THE QUALITY OF LIFE REGARDING THE ORAL HEALTH OF CHILDREN AND THEIR ATTITUDES TOWARDS THE CARIES AND ORAL HYGIENE**

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**Aim:** Violation of the child's oral health not only affects the quality of life of the child but

**IMAJU LI DOKTORI DENTALNE MEDICINE I PARODONTOLOZI ULOGU U LIJEČENJU PRETILOSTI? PRIKAZ SLUČAJA.**Musić L<sup>1</sup>, Jurlina D<sup>2</sup>, Čatović I<sup>3</sup>, Puhar I<sup>1</sup><sup>1</sup> Zavod za parodontologiju, Stomatološki fakultet Sveučilišta u Zagrebu, Hrvatska<sup>2</sup> Medicinski fakultet Sveučilišta Josipa Jurja Strossmayera u Osijeku, Hrvatska<sup>3</sup> Privatna ordinacija dentalne medicine Dr. Čatović, Pula, Hrvatska

**Svrha:** Debljina (BMI> 30) se smatra jednim od glavnih javnozdravstvenih problema današnjice u svijetu i Hrvatskoj, gdje se procjenjuje da zahvaća 18,7% odrasle populacije. Istraživanja sugeriraju da postoji povezanost između parodontitisa i debljine. Ovaj prikaz slučaja predstavlja 33-godišnju pretilu ženu (BMI ~ 36) s generaliziranim parodontitisom stadij III, razred C kojoj je provedena inicijalna parodontološka terapija te naglašava ulogu parodontologa u promjeni zdravih obrazaca ponašanja.

**Materijali i metode:** Pacijentica, sistemski zdrava, upućena je na parodontološko liječenje zbog kontinuiranog krvarenja gingive, patološkog pomicanja i povećane pokretljivosti zubi. Kliničkim i radiografskim pregledom uočena je upaljena gingiva (FMBS 100%), neadekvatna oralna higijena (FMPS 83%), generalizirani parodontni džepovi do 12 mm dubine i gubitak alveolarne kosti do apikalne trećine korijena. Parodontolog je pacijentici objasnio povezanost između dva stanja i proveo motivacijski intervju kako bi ojačao unutarnju motivaciju pacijentice i predanost zdravim promjenama ponašanja. Inicijalna, nekirurška terapija provedena je po kvadrantima, uz primjenu sistemskih antibiotika nakon završetka terapije, uz ponavljanje OHI i re-motivaciju. U vrijeme liječenja, pacijentica se uključila u organizirani oblik tjelesne aktivnosti.

**Rezultati:** Re-evaluacijom liječenja, zabilježene su smanjene dubine parodontnih džepova, gingivnog krvarenja (PMBS 50%) i plaka (FMPS 20%), uz zaostatak značajnog broja rezidualnih džepova koji zahtijevaju korektivno, kirurško liječenje. Godinu dana od početka terapije, pacijentica je izgubila 10kg tjelesne težine.

**Zaključak:** Doktor dentalne medicine i parodontolozi trebaju biti svjesni važnosti motivacijskog intervju i liječenja parodontitisa u pretilih pacijenata.

**Ključne riječi:** pretilost; parodontitis

**POVEZANOST IZMEĐU PREHRAMBENO-HIGIJENSKIH NAVIKA I ORALNOG ZDRAVLJA KOD DJECE ŠKOLSKO DOBI.**Reić T<sup>1</sup>, Galić T<sup>2</sup>, Milatić K<sup>1</sup>, Negovetić Vranić D<sup>3</sup><sup>1</sup> Poslijediplomski doktorski studij, Stomatološki fakultet, Sveučilište u Zagrebu, Zagreb, Hrvatska<sup>2</sup> Katedra za protetiku dentalne medicine, Studij dentalne medicine, Medicinski fakultet Sveučilišta u Splitu, Split, Hrvatska<sup>3</sup> Zavod za dječju i preventivnu stomatologiju, Stomatološki fakultet, Sveučilište u Zagrebu, Zagreb, Hrvatska

**Svrha:** Cilj istraživanja bio je istražiti povezanost prehrambeno-higijenskih navika i oralnog zdravlja kod djece školske dobi.

**Materijali i metode:** U istraživanju je sudjelovalo 143 učenika iz Osnovne škole Blato u Blatu, u dobi od šest do trinaest godina. Djeca su podijeljena u dvije skupine: učenici nižih razreda (6-9 godina, n = 82) i učenici viših razreda (10-13 godina, n = 61) osnovne škole. Istraživanje je provedeno pomoću upitnika o oralno-higijenskim navikama i kliničkog pregleda u ordinaciji dentalne medicine. Izračunati su karijes-ekstrakcija-ispun indeks (KEP) i plak indeks. DIAGNOdent pen uređaj je korišten za procjenu prisutnosti karijesa na prvim trajnim kutnjacima.

**Rezultati:** Rezultati ovog istraživanja pokazali su da između ispitivanih skupina nema statistički značajnih razlika u konzumaciji zaslađene hrane i pića. Od ukupno 143 djece, 124 (86,71%) njih peru zube jednom ili više puta dnevno. KEP indeks kod starije djece (10-13 godina, KEP = 2,66 ± 2,45) značajno je viši ( $p < 0,001$ ) od KEP indeksa kod mlađe djece (6-9 godina, KEP = 1,08 ± 1,36). Utvrđeno je da nema statistički značajnih razlika u vrijednostima plak indeksa između mlađe i starije djece ( $p = 0,119$ ), kao i u vrijednosti dobivenim DIAGNOdent pen uređajem (16-p = 0,709; 26-p = 0,902; 36-p = 0,135; 46-p = 0,257).

**Zaključak:** KEP indeks kod djece starije dobi viši je od KEP indeksa djece mlađe dobi iako su njihove prehrambeno-higijenske navike jednake.

**Ključne riječi:** prehrambeno-higijenske navike; oralno zdravlje; djeca školske dobi

**POVEZANOST RODITELJSKE PROCJENE KVALITETE ŽIVOTA S OBIZROM NA ORALNO ZDRAVLJE DJECE SA STAVOVIMA O KRIJESU I ORALNOJ HIGIJENI**

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**Svrha:** Narušavanje oralnog zdravlja djeteta ne samo da utječe na kvalitetu života djeteta,

also the quality of life of the family in which he lives. This study aimed to evaluate the assessment of the influence of attitudes on oral hygiene and caries on the results of the Early Childhood Oral Health Impact Scale (ECOHIS test).

**Materials and Methods:** The study included 253 children whose oral status was recorded and 253 parents who filled out the life quality assessment test about oral health (ECOHIS), the questionnaire about dental caries and oral hygiene as well as the Depression, Anxiety Stress Scale (DASS) questionnaire. The data were evaluated by the Student T-test and Spearman's correlation analysis.

**Results:** Parents whose children have a higher number of active caries ( $R=0.389$ ,  $P<0.001$ ) and a higher dmft index ( $R=0.399$ ,  $P<0.001$ ), have a higher ECOHIS test result. As many as 69.10% of the examined parents think they are not well informed about the prevention of oral diseases.

**Conclusion:** Oral health of a child affects his quality of life and the quality of life of his family. ECOHIS test, translated from English into Croatian, is a suitable method of analyzing the connection between oral health and the quality of life of children and the community they live in.

**Key words:** parental assessment of the quality of life; oral health of children

#### THE ASSOCIATION BETWEEN THE KNOWLEDGE OF PREVENTIVE PROCEDURES AND PARENTAL DENTAL ANXIETY IN CHILDREN WITH EARLY CHILDHOOD CARIES.

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**Aim:** An increasing phenomenon of dental anxiety requires timely diagnosis, prevention of its occurrence, and adaptation of treatment to such patients. The aim of this study was to determine the level of dental anxiety in the parents of children younger than 6 and to assess whether parents level of knowledge about preventive procedures and child's oral health affected the dental anxiety.

**Material and methods:** The study involved 253 parents. Each child underwent a detailed clinical examination of the oral cavity and the DMF index calculated. The three-part questionnaire was given to the parents. The first part of the survey refers to general demographic data as well as a child's oral hygiene and eating habits. The second part contains S-DAI questionnaires as the primary criterion for dental anxiety while the third part includes a questionnaire on knowledge of preventive procedures.

**Results:** The incidence of dental anxiety was higher in children with active caries lesions while it was lower in children with the DMF index  $\geq 1$  ( $P=0.036$ ). The number of extracted teeth in children significantly influences on the level of dental anxiety ( $\beta=4.764$ ;  $P=0.043$ ). The results also showed that there is no difference in the level of parental knowledge about preventive procedures given the number of active caries ( $P=0.569$ ) and the DMF index ( $P=0.427$ ) among children.

**Conclusion:** This research has shown that there is an intermediate degree of dental anxiety development in parents who have completed the questionnaire. This research has also shown that parents who develop dental anxiety are more likely to brush their children's teeth but rarely take their children to a dental office to get used to dental treatments, which isn't in line with WHO recommendations.

**Key words:** preventive procedures; dental anxiety

#### NEEDLE STICKS INJURIES AMONG DENTAL STUDENTS AND DENTISTS: KNOWLEDGE, ATTITUDE, AND PRACTICE

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**Aim:** Risk of exposure to blood-borne pathogens has always been a problem for dental professionals. The aim of this study was to assess the level of knowledge and practice of needle stick injuries and other accidental exposures, and to estimate the incidence of them among Croatian dental students and dentists.

**Materials and Methods:** Cross-sectional survey was conducted among 419 dentists, and 311 dental students. The data were recorded on a structured on-line questionnaire to elicit the level of knowledge; awareness and practice towards practice needle stick incidents injuries and other accidental exposures.

**Results:** Dentists who knew the post exposure prophylactic measures had a lower incidence of practice needle stick injuries and other accidental exposures incidents (121 vs. 101,  $P=0.001$ ), and more often reported them (20 vs. 9,  $P=0.016$ ). Senior students had a higher incidence of exposure incidents (13, 32 vs. 34,  $P=0.009$ ), and those who have the habit of recapping the needle (77 vs. 2,  $P=0.021$ ).

već i na kvalitetu života cijele obitelji u kojoj živi. Cilj ovog istraživanja bio je ispitati utjecaj stavova o karijesu i oralnoj higijeni na rezultate procjene roditelja o kvaliteti života s obzirom na oralno zdravlje djece mlađe od šest godina (ECOHIS test).

**Materijali i metode:** U istraživanju je sudjelovalo 253 djece kojima je napravljen oralni pregled, te 253 roditelja koji su ispunili test procjene kvalitete života s obzirom na oralno zdravlje djece (ECOHIS test), upitnik stavova o zubnom karijesu i oralnoj higijeni te DASS upitnik. Za utvrđivanje razlike vrijednosti dobovenih na ECOHIS testu i testu znanja o preventivnim postupcima između roditelja s obzirom na pojavnost karijesa kod djece korišten je Student T-test. Spearmanovom korelacijskom analizom utvrđena je povezanost između varijabli.

**Rezultati:** Viši rezultat ECOHIS testa imaju roditelji čija djeca imaju veći broj aktivnih karijesa ( $R=0.389$ ,  $P<0.001$ ) i viši KEP indeks ( $R=0.399$ ,  $P<0.001$ ). Čak 69,10% ispitanih roditelja smatra se nedovoljno informirano u pogledu prevencije oralnih bolesti.

**Zaključak:** Oralno zdravlje djeteta utječe na kvalitetu života djeteta i zajednice u kojoj živi. ECOHIS test, preveden s engleskog jezika na hrvatski, dobra je metoda analize povezanosti oralnog zdravlja i kvalitete života djeteta i zajednice u kojoj živi.

**Glavne riječi:** roditeljska procjena kvalitete života; oralno zdravlje djece

#### POVEZANOST ZNANJA O PREVENTIVNIM POSTUPCIMA I DENTALNE ANKSIJZNOSTI RODITELJA DJECE S RANIM DJEČJIM KARIJESOM

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**Svrha:** Sve veća pojava razvoja dentalne anksioznosti zahtjeva pravovremeno postavljanje dijagnoze, sprječavanja njenog nastanka te prilagodbu tretmana takvim pacijentima. U ovom radu bio je cilj utvrditi razinu dentalne anksioznosti roditelja djece mlađe od 6 godina te utvrditi ima li razina znanja o preventivnim postupcima i oralno zdravlje djece utjecaj na istu.

**Materijali i metode:** U istraživanju je sudjelovalo 253 roditelja djece mlađe od 72 mjeseca. Svakom djetetu je napravljen detaljan klinički pregled usne šupljine sa zabilježenim dentalnim statusom, a roditelji su za to vrijeme ispunili upitnik. Prvi dio upitnika odnosio se na opće demografske podatke, navike oralne higijene i prehrambene navike djeteta. Drugi dio je sadržavao S-DAI upitnik kao mjerilo razine dentalne anksioznosti, dok se treći dio sastojao od upitnika o poznavanju preventivnih postupaka.

**Rezultati:** Učestalost pojave dentalne anksioznosti bila je veća u djece s aktivnim karijesnim lezijama dok se pokazalo kako je pojava dentalne anksioznosti manja u djece s KEP indeksom  $\geq 1$  ( $P=0.036$ ). Na razinu dentalne anksioznosti značajno utječe broj ekstrahiranih zubi u djece ( $\beta=4.764$ ;  $P=0.043$ ). Rezultati su također pokazali kako nema razlike u razini znanja roditelja o preventivnim postupcima s obzirom na broj aktivnih karijesa ( $P=0.569$ ) i KEP indeks ( $P=0.427$ ) u djece.

**Zaključak:** Ovim istraživanjem smo dokazali kako u roditelja koji su ispunili upitnik postoji srednji stupanj razvoja dentalne anksioznosti. Također je dokazano kako roditelji u kojih se razvila dentalna anksioznost češće peru djeci zube, ali ih rjeđe dovode na privikavanje u ordinaciju dentalne medicine, što se kosi s preporukama Svjetske zdravstvene organizacije.

**Glavne riječi:** preventivni postupci; dentalna anksioznosti

#### UBODNI INCIDENTI MEĐU STUDENTIMA I DOKTORIMA DENTALNE MEDICINE – ZNANJE, STAVOVI I PRAKSA

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**Svrha:** Rizik izlaganja patogenima koji se prenose krvlju veliki je problem za djelatnike dentalne medicine. Cilj studije bio je procijeniti razinu znanja i prakse kod ubodnih i ekspanzijskih incidenata, te učestalost istih u hrvatskih studenata i doktora dentalne medicine.

**Materijali i metode:** Presječna studija provedena je na 419 doktora i 311 studenata dentalne medicine. Podaci su skupljani preko strukturiranog online upitnika koji je ispitivao njihovo znanje, stavove i praksu vezano uz ubodne i ekspanzijske incidente.

**Rezultati:** Doktori dentalne medicine koji poznaju profilaktičke mjere koje se provode nakon ubodnog i ekspanzijskog incidenta imaju manju učestalost istih (121 vs. 101,  $P=0.001$ ) te ih češće prijavljuju (20 vs. 9,  $P=0.016$ ). Studenti viših godina imaju veću učestalost ekspanzijskih incidenata (13, 32 vs. 34, 12,  $P=0.009$ ), kao i oni studenti koji u svom radu imaju naviku vraćanja kapice na korišćenu iglu (77 vs. 2,  $P=0.021$ ).

**Zaključak:** Rezultati ove studije potvrđuju kako studenti i doktori dentalne medicine ima-

Conclusion: The results of this study confirmed that dentists and dental students experience more needle stick incidents and other accidental exposures than the reported number. Therefore, emphasis should be placed on training and knowledge of pre-exposure and post-exposure preventive measures among dental practitioners.

Key words: needle sticks injuries; dental students; dentists

#### KNOWLEDGE ABOUT TRAUMATIC DENTAL INJURIES: A SURVEY OF CROATIAN PEDIATRICIANS

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Aim: Dental trauma is one of the important oral health problems in adolescent and childhood period. This cross-sectional study has assessed the level of knowledge of Croatian pediatricians concerning the management of dental trauma.

Materials and methods: A questionnaire-based study has assessed personal and professional characteristics, knowledge and experience with dental injuries among 186 pediatricians. The data have been evaluated by the Student-T test or one-way ANOVA, with Tukey's post-hoc. The level of significance was set at  $P \leq 0.05$ .

Results: The overall mean self-reported knowledge of dental trauma management was  $3.58 \pm 1.53$ , with a maximum possible score of seven. Better knowledge has been observed among male pediatricians ( $3.89 \pm 1.44$  vs.  $3.35 \pm 1.56$ ,  $P = 0.016$ ), those who have witnessed dental injuries ( $3.95 \pm 1.44$  vs.  $3.28 \pm 1.54$ ,  $P = 0.003$ ), and who have had more than ten years of paediatric practices compared to those who have had less ( $3.98 \pm 1.60$  vs.  $3.26 \pm 1.49$ ,  $P = 0.027$ ). Results of multiple linear regression analysis have showed significant dependence of measured overall dental injuries management knowledge score with paediatrician's practice settings ( $b = -0.254$ ,  $P = 0.002$ ) and the number of treated patients per day ( $b = -0.187$ ,  $P = 0.030$ ).

Conclusion: Paediatricians have moderate knowledge regarding preliminary care of traumatic dental injuries. Dental trauma emergency management should be recommended as part of their educational training.

Key words: dental trauma; knowledge; pediatricians

#### KNOWLEDGE AND ATTITUDES OF SOCCER COACHES ABOUT SPORTS-RELATED DENTAL INJURIES AND EMERGENCY PROCEDURES

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Aim: The aim of this study was to investigate knowledge of soccer coaches regarding sports-related dental trauma and emergency procedures for such injuries.

Materials and methods: There were 127 soccer coaches from 25 to 69 years old participating in this study. A specific questionnaire consisting of 26 questions regarding knowledge and attitudes about sports-related dental trauma, emergency procedures and preventive measures was delivered to participants during the seminar for soccer coaches held by the Croatian Football Federation, in August 2018. in Split, Croatia.

Results: Participants were divided in two groups regarding their professional education. There were 60 participants (47.2%) with high school education and 67 participants (52.8%) with master or bachelor degree. Results of this study showed that significantly more soccer coaches with higher education (43.3%) knew about avulsion in comparison to those with lower level of education (23.3%) ( $P=0.018$ ). Also, there were more coaches with higher education (40.3%) than those with lower level of education (23.3%) who were familiar with the tooth rescue box ( $P=0.042$ ). Concerning the procedure with the avulsed tooth there were 66.9% participants who would maintain the avulsed tooth in handkerchief or gauze and even 10.2% participants would throw the avulsed tooth away. There were no statistically significant differences between the groups.

Conclusion: The results of this study demonstrated that soccer coaches do not have adequate knowledge about sports-related dental trauma and emergency procedures for such injuries. Educational programs about sports-related dental trauma should become a part of their professional coaching education.

Key words: soccer coaches; sports-related dental injuries; emergency procedures

ju iskustvo većeg broja ubodnih i ekspozicijskih incidenata nego prijave. Stoga treba staviti veći naglasak na trening i upoznavanje predekspozicijski i postekspozicijskih preventivnih mjera među dentalnim djelatnicima.

Ključne riječi: ubodni incidenti; studenti; doktori dentalne medicine

#### ZNANJE PEDIJATARA REPUBLIKE HRVATSKE O TRAUMATSKIM OZLJEDAMA ZUBA

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Svrha: Dentalne traume su jedan od važnih problema oralnoga zdravlja djece i adolescenata. Cilj ove presječne studije bila je procjena znanja hrvatskih pedijatara u zbrinjavanju traumatskih ozljeda zuba.

Materijali i metode: Istraživanjem se temeljilo na anketnom upitniku kojim su se ispiti-vale opće i profesionalne karakteristike, te znanje i iskustvo s traumatskim ozljedama zuba među 186 pedijatara. Podaci su obrađeni Student-T testom ili jednosmjernom analizom varijance (ANOVA) s Tukeyevim post-hoc testom. Razina značajnosti je postavljena na  $P \leq 0.05$ .

Rezultati: Ukupna srednja vrijednost samoprocjene znanja u zbrinjavanju traumatskih ozljeda zuba bila je  $3,58 \pm 1,53$ , s maksimalnim mogućim rezultatom od sedam. Bolje znanje uočeno je kod muških pedijatara ( $3,89 \pm 1,44$  vs  $3,35 \pm 1,56$ ,  $P = 0,016$ ), te onih koji su bili svjedoci ozljeda zuba ( $3,95 \pm 1,44$  vs  $3,28 \pm 1,54$ ,  $P = 0,003$ ), kao i onih koji su imali više od deset godina staža u pedijatrijskoj praksi u usporedbi s onima koji su imali manje ( $3,98 \pm 1,60$  vs  $3,26 \pm 1,49$ ,  $P = 0,027$ ). Rezultati višestruke linearne regresijske analize pokazali su značajnu ovisnost rezultata mjerenja ukupnog znanja o zbrinjavanju traumatskih ozljeda zuba i razine pružanja zdravstvene zaštite ( $\beta = -0,254$ ,  $P = 0,002$ ) te brojem pacijenata koje obrade u radnom danu ( $\beta = -0,187$ ,  $P = 0,030$ ).

Zaključak: Pedijatri su pokazali umjereno znanje u zbrinjavanju traumatskih ozljeda zuba. Liječenje traumatskih ozljeda zuba trebao bi biti sastavni dio njihovog obrazovnog programa tijekom specijalističkog usavršavanja.

Ključne riječi: dentalna trauma; pedijatri; znanje

#### ZNANJE I STAVOVI NOGOMETNIH TRENERA O SPORTSKIM DENTALNIM OZLJEDAMA I NJIHOVOM HITNOM ZBRINJAVANJU

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Svrha: Cilj ovog istraživanja bio je ispitati znanje i stavove nogometnih trenera o sportskim dentalnim ozljedama i njihovom hitnom zbrinjavanju.

Materijali i metode: U istraživanju je sudjelovalo 127 nogometnih trenera u dobi od 25 do 69 godina. Tijekom Seminara trenera Hrvatskog nogometnog saveza održanog u kolovozu 2018. u Splitu, Hrvatska, trenerima je podijeljen upitnik koji je sadržavao 26 pitanja o sportskim dentalnim traumama, njihovom sportskom zbrinjavanju i prevenciji. Rezultati: Ispitanici su podijeljeni u dvije skupine s obzirom na njihovu edukaciju. Bilo je 60 ispitanika (47,2%) sa srednjom stručnom spremom i 67 ispitanika (52,8%) sveučilišnih prvostupnika ili magistara struke. Rezultati ovog istraživanja pokazali su da je statistički značajno više trenera s većim stupnjem obrazovanja (43,3%) znalo što je avulzija u odnosu na trenere s nižim stupnjem obrazovanja (23,3%) ( $P=0,018$ ). Također, više trenera s većim stupnjem obrazovanja (40,3%) su čuli za sredstvo za pohranjivanje izbijenog zuba ( $P=0,042$ ). Među ispitanicima bilo je 66,9% onih koji bi izbijeni zub zamotali u maramicu ili gazu, a čak 10,2% ispitanika izbijeni bi zub bacili, pri čemu nije bilo statistički značajne razlike između dviju skupina trenera s obzirom na stupanj obrazovanja.

Zaključak: Rezultati ovog istraživanja pokazali su da nogometni treneri nemaju odgovarajuće znanje o sportskim dentalnim traumama i njihovom hitnom zbrinjavanju te bi takvu edukaciju trebalo uključiti u njihovo profesionalno trenersko obrazovanje.

Ključne riječi: nogometni treneri; sportske dentalne ozljede; zbrinjavanje



# ASSESSMENT OF PREVALENCE OF DENTAL EROSION IN YOUNG SWIMMERS EXPOSED TO CHLORINATED SWIMMING POOL WATER

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**Aim:** The purpose of this study was to evaluate the occurrence of dental erosion in young swimmers exposed to chlorinated swimming pool water and to assess the intrinsic and extrinsic risk factors.

**Material and methods:** This study included 25 young swimmers from Split, Croatia who practiced in a swimming pool with chlorinated water at least 1 h / day five days a week, for more than one year. The study consisted of two parts – clinical dental examination and a standardized questionnaire about risk factors for dental erosion, oral-hygienic and nutritional habits of young swimmers.

**Results:** There were 15 boys (60%) and 10 girls (40%) included in this study, aged 13 years (11-16 years), and the average time of participating in sport was 6 years (2-12 years). Dental erosion was found in 12 (48%) participants. Changes were more frequent in boys (53.3%) than in girls (40%) ( $P=0.522$ ). The training period of four subjects (33.3%) with dental erosion did not exceed 5 years, while eight respondents (66.7%) with confirmed changes were training for more than 5 years. Out of the total number of subjects with dental erosion 83.3% spent more than six hours weekly in the swimming pool. There were no significant differences in analyzed risk factors between the participants without and with dental erosion.

**Conclusion:** The results of this study demonstrated that dental erosion occurred in young swimmers and it was associated with the time spent in the swimming pool weekly and with the duration of participating swimming.

**Key words:** dental erosion; chlorinated swimming pool water

# PROCJENA UČESTALOSTI DENTALNE EROZIJE U DJECE PLIVAČA IZLOŽENIH Kloriranoj BAZENSKOJ VODI

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**Svrha:** Procijeniti učestalost dentalne erozije u djece plivača izloženih kloriranoj bazenskoj vodi te usporediti učestalost intrinzičnih i ekstrinzičnih rizičnih čimbenika u ispitanika bez dentalne erozije i onih s dentalnom erozijom.

**Materijali i metode:** U istraživanju je sudjelovalo 25 djece plivača iz Splita koji treniraju u bazenu s kloriranim vodom najmanje 1h/dan pet dana tjedno, dulje od godine dana. Istraživanje se sastojalo od dva dijela – kliničkog stomatološkog pregleda i upitnika o rizičnim čimbenicima za nastanak dentalne erozije te oralno-higijenskim i prehranbenim navikama djece plivača.

**Rezultati:** Od ukupno 25 ispitanika, bilo je 15 dječaka (60%) i 10 djevojčica (40%). Prosječna dob ispitanika bila je 13 godina (11-16 godina), a prosječno vrijeme bavljenja sportom šest godina (2-12 godina). Od ukupnog broja ispitanika njih 12 (48%) je imalo promjene na zubima klasificirane kao dentalna erozija. Promjene su bile učestalije u dječaka (53,3%) nego u djevojčica (40%), ali razlika nije bila statistički značajna ( $P=0,522$ ). Duljina treniranja četiri ispitanika (33,3%) s dentalnom erozijom nije prelazila pet godina, dok je osam ispitanika (66,7%) s potvrđenim promjenama treniralo dulje od pet godina te je 83,3% djece plivača s dentalnom erozijom provelo više od šest sati tjedno u bazenu. Nije bilo značajne razlike u učestalosti rizičnih čimbenika između ispitanika bez dentalne erozije i onih s dentalnom erozijom.

**Zaključak:** Ovo istraživanje upotpunilo je dosadašnje spoznaje o učestalosti dentalne erozije u djece plivača izloženih kloriranoj bazenskoj vodi te je pokazalo kako postoji povezanost dentalne erozije u plivača izloženih kloriranoj bazenskoj vodi s duljinom treniranja i vremenom provedenim u bazenu tjedno.

**Glavne riječi:** dentalna erozija; klorirana bazenska voda

# THE ESTABLISHMENT OF A RADIOTHERAPY-INDUCED ORAL MUCOSITIS MODEL IN RATS USING Gynaecological BRACHYTHERAPY PROBE

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**Aim:** To establish radiotherapy-induced oral mucositis (RTOM) model, we used a gynaecological

brachytherapy probe to modify a previously used method of rat's tongue irradiation (1). **Materials and method:** Gynaecological brachytherapy probe (diameter 6mm, radionuclide Cs-137) was inserted in male Wistar Albino rats (200-250 g bw) into oral cavity from the right side to the depth of 25 mm from incisors to pharynx. Area of the insertion (lips, oral mucosa, tongue, oral cavity) was then exposed to a single dose of 30 Gy (exposure time 3480 s). Rats were monitored daily following the irradiation for signs of RTOM. Animals were sacrificed at day 3, 7, 10 after irradiation.

**Results:** Immediately after irradiation all of the rats exhibited severe edema of the snout, upper and lower lip with evident paresis of the lip in area directly exposed to radiation. In particular, four days after irradiation, erythema of the irradiated area appeared and progressed during day 5 and day 6. At day 7 after irradiation, ulcerations appeared along erythema. RTOM peaked on day 10 and included severe erythema and ulcerations. In general, microscopy is along with gross lesions presentation.

**Conclusion:** Therefore, we established RTOM instead of radiotherapy-induced glossitis described in the original model (1). These findings conform with dynamic of oral mucositis in the head and neck irradiated patients. Thus, the described model can be used to investigate strategies for prevention and/or treatment of oral mucositis.

**Key words:** radiotherapy-induced oral mucositis; model

# FORMIRANJE MODELA ORALNOG MUKOZITISA INDUCIRANOG ZRAČENJEM NA ŠTAKORIMA KORIŠTENJEM GINEKOLOŠKE SONDE ZA BRAHITERAPIJU

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**Svrha:** Za formiranje modela oralnog mukozitisa induciranog zračenjem (RTOM) koristili smo ginekološku sondu za brahiterapiju kako bi modificirali prethodno korištenu metodu zračenja jezika štakora.

**Materijali i metode:** Ginekološka sonda za brahiterapiju (promjer 6 mm, radioizotop Cs-137) uvedena je s desne strane u usnu šupljinu mužjaka Wistar Albino štakora (mase 200-250 g) u dubini od 25 mm od inciziva prema ždrijelu. Područje u koje je uvedena sonda (usnice, oralna sluznica, jezik i orofarinks) zatim je jednokratno ozračeno dozom od 30 Gy (vrijeme ekspozicije 3480 s). Nakon zračenja svakodnevno su praćeni znakovi RTOM-a.

**Rezultati:** Odmah nakon zračenja svi štakori su pokazivali jaki edem njuške, gornje i donje usne, s evidentnom parezom usne u području direktno izloženom zračenju. Nadalje, 4. dan nakon zračenja pojavio se eritem ozračenog područja, a progredirao je 5. i 6. dan. Sedam dana nakon zračenja uz eritem pojavile su se i ulceracije. Vrhunac RTOM-a bio je deseti dan, a uključivao je jaki eritem i ulceracije. Općenito, mikroskopski nalazi su u skladu s prezentacijom makroskopskih lezija.

**Zaključak:** Umjesto radioterapijom induciranog glositisa opisanog u originalnom modelu, utvrdili smo RTOM. Nalazi odgovaraju dinamici oralnog mukozitisa u pacijenata ozračenih u području glave i vrata. Stoga se opisani model može koristiti za istraživanje prevencije i/ili liječenja oralnog mukozitisa.

**Glavne riječi:** oralni mukozitis induciran zračenjem; model



# PALEOSTOMATOLOGICAL ANALYSIS OF SKELETAL REMAINS FROM THE ARCHAEOLOGICAL SITE OF VESELA STRAŽA – CRKVINE

Marić M

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**Aim:** Paleostomatological analysis will determine the odontobiography and reconstruction of certain aspects of the life of human skeletal remains found on a private property in Vesela near Bugojno, Bosnia and Herzegovina, in 2015, in the remnants of the medieval church, where 11 graves were discovered with a total of 12 skeletons.

**Materials and Methods:** Skeletal remains have been inventory of the found bones of the skull and teeth. Sex was determined on the basis of craniofacial bones traits, and the age at the degree of cranial sutures closure and the abrasion of teeth by Lovejoy. The data on the teeth were recorded on the form, where presence, caries changes, calculus formation, abrasion, resorption, periapical changes, orthodontic anomalies and particular characteristics were noted. **Results:** It was found that 9 remains belong to adult men aged 30-55, one female 45-50 years, and two children aged 3-5 years. A total of 128 adult teeth were analyzed, of which 64 were in alveoli and 64 with no alveoli. Antemortally 12, and postmortally 47 teeth were lost. Caries is present on 34 teeth, mostly single-stage, degree 2. The calculus is formed on 41 teeth, degree 1, the mild resorption of alveolar bone is present on most samples. Abrasion is present on 95 teeth, stage 1-3, most significant in older people. Periapical abscesses were found on 3 teeth. Hipoplastic changes were not observed. Orthodontic anomalies could not be determined due to bone fragmentation. There were signs of anemia and nonspecific infectious diseases in children's skeletons.

**Conclusion:** Taking age, the observed changes in the teeth, socioeconomic status and historical connotations into account, can be said to be a mixed population, dealing with both hunting and farming and feeding on grains and grown vegetables. It was not possible to determine the potential parenting relationship.

**Key words:** paleostomatological analysis; skeletal remains

# PALEOSTOMATOLOŠKA ANALIZA SKELETNIH OSTATAKA S ARHEOLOŠKOG LOKALITETA VESELA STRAŽA- CRKVINE

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**Svrha:** Paleostomatološkom analizom utvrditi će se odontobiografija i rekonstrukcija pojedinih aspekata života ljudskih skeletnih ostataka pronađenih na privatnom imanju u Veseloj kod Bugojna, BIH, 2015. u ostacima srednjovjekovne crkve, unutar koje je otkriveno 11 grobnih mjesta s ukupno 12 skeleta.

**Materijali i metode:** Na skeletnim ostacima je učinjena inventura pronađenih kostiju lubanje i zubi. Spol je određivan na temelju kraniofacijalnih osealnih osobina, a dob po stupnju srašavanja kranijalnih šavova i abraziji zubi po Lovejoyu. Podaci o zubima su bilježeni po obrascu, gdje se označavala prisutnost, podaci o karioznim promjenama, naslagama kamenca, abraziji, resorpciji, periapikalnim promjenama, ortodontskim anomalijama te pojedinim posebnim obilježjima.

**Rezultati:** Utvrđeno je da 9 ostataka pripada odraslim muškarcima u dobi od 30-55 god., jednoj ženi od 45-50 god., te dvoje djece u dobi 3-5 god. Ukupno je analizirano 128 zubi odraslih, od kojih su 64 bila u alveoli, a 64 bez alveole. Antemortalno je izgubljeno 12, a postmortalno 47 zubi. Karijes je prisutan na 34 zuba, uglavnom jednodoplošni, stupnja 2. Kamenac je utvrđen na 41 zubu, stupnja 1, blaga resorpcija alveolarne kosti je prisutna na većini uzoraka. Abrazija je prisutna na 95 zuba, stupnja 1-3, značajnija je kod starijih osoba. Periapikalni apsces je nađen na 3 zuba. Hipoplastične promjene nisu uočene. Ortodontske anomalije nije bilo moguće odrediti zbog fragmentiranosti kostiju. Na dječjim skeletima uočene su naznake anemije i nespecifičnih zaraznih bolesti.

**Zaključak:** Uzimajući u obzir dob, uočene promjene na zubima, socioekonomski status i povijesne konotacije možemo reći da se radi o mješovitom populaciji, koja se bavila i lovom i zemljoradnjom i hranila žitaricama i uzgojenim povrćem. Nije bilo moguće utvrditi potencijalnu rodbinsku vezu.

**Ključne riječi:** paleostomatološka analiza; skeletni ostatci

# SALIVARY SQUAMOUS CELL CARCINOMA ANTIGEN 1 AND 2 IN PATIENTS WITH LEUKOPLAKIA: A PILOT STUDY

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**Aim:** Leukoplakia is the most common potentially malignant oral disorder (PMOD) with a worldwide prevalence of 2% and a malignant transformation rate of 0.3%. Squamous cell carcinoma antigens (SCCA) are part of the serpins family. They are involved in inflammation, apoptosis, cell-migration and are expressed in the squamous cell epithelium. SCCA2 protein is 92% homologous to SCCA1, however these antigens are not expressed concurrently and play different roles in the human body. Their role in the healthy and malignant tissues is not clearly understood.

**Materials and methods:** Unstimulated whole saliva (UWS) and stimulated whole saliva (SWS) were sampled from 5 patients with leukoplakia (5 male) and 12 age and sex matched control subjects. Leukoplakia was diagnosed with a C<sub>1</sub> certainty factor. Sandwich human SCCA1 and SCCA2 ELISA Kits, My BioSource, San Diego, USA, were used. Respondents' alcohol consumption, papilla bleeding index (PBI), smoking, drug consumption and medical condition was registered. This study has been funded by the Croatian Science Foundation (IP-09-2014-9376).

**Results:** Salivary SCCA1 was significantly higher in patients with leukoplakia in UWS (U=4, p=0.045). No statistically significant difference in SCCA2 levels in UWS and SWS between the two groups was found. Due to the small sample size, smoking, PBI, medical conditions, drug and alcohol consumption had no statistical significance.

**Conclusion:** Salivary SCCA1 could serve as a satisfactory biomarker for leukoplakia. However, a greater sample is needed to establish the diagnostic value of the investigated molecules. To our knowledge, SCCA1 and SCCA2 have not yet been measured in patients with leukoplakia.

**Key words:** salivary squamous cell carcinoma; antigen 1 and 2; leukoplakia

# SALIVARNI SQUAMOUS CELL CARCINOMA ANTIGEN 1 I 2 U PACIJENATIMA S LEUKOPLAKIJOM: PILOT ISTRAŽIVANJE

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**Svrha:** Leukoplakija je najčešći potencijalno maligni poremećaj (PMOP) s prevalencijom od 2% i ratom maligne transformacije od 0.3%. Squamous cell carcinoma antigeni (SCCA) spadaju u obitelj serpina te sudjeluju u procesu upale, apoptozu, migraciji stanica te su izraženi u stanicama višeslojnog pločastog epitela. SCCA2 protein je 92% homologan SCCA1 proteinu te se donedavno u istraživanjima ove dvije molekule nisu razlikovale. Imaju različitu ulogu u organizmu te su kodirani dvama različitim genima. Njihova uloga u organizmu nije u potpunosti poznata.

**Materijali i metode:** Uzorkovana je nestimulirana (NS) i stimulirana slina (SS) 5 muškaraca s leukoplakijom i 12 muškaraca kontroliranih prema dobi. Leukoplakija se dijagnosticirala sa stupnjem sigurnosti C<sub>1</sub>. Korišteni su komercijalno dostupni Sandwich human SCCA1 i SCCA2 ELISA kitovi (My BioSource, San Diego, USA). Uzimala se detaljna medicinska anamneza, određivao Papillary Bleeding Index (PBI) i registrirala konzumacija duhana i alkohola. Istraživanje je financirano sredstvima Hrvatske zaklade za znanost (IP-09-2014-9376).

**Rezultati:** Statistički je značajno viša koncentracija SCCA1 u NS ispitanika s leukoplakijom (U=4, p=0.045). Nije pronađena statistički značajna razlika u koncentracijama SCCA2 između skupina u NS i SS. Zbog malog uzorka, nisu se pokazale značajnim konzumacija duhana, alkohola, PBI, uzimanje lijekova i sistemske bolesti.

**Zaključak:** Salivarni SCCA1 mogao bi predstavljati potencijalni biljeg za leukoplakiju, međutim potrebna je analiza većeg broja uzoraka kako bi se procijenio dijagnostički značaj ovih antigena. Prema našem saznanju, SCCA1 i SCCA2 dosad nisu mjereni u slini ispitanika s leukoplakijom.

**Ključne riječi:** salivarni squamous cell carcinoma; antigen 1 i 2; leukoplakija